FACULTY APPROVAL

Comparative Testing Results Between Students Involved in Gear-Up and Students Not Involved in Gear-Up

Approved for the Faculty

_____, Faculty Advisor

_____, Date

ABSTRACT

The purpose of this study was to provide evidence that students actively involved in the Gear-Up program would have better scores on the WASL science test administered in eighth grade than students not involved with the Gear-Up program. The author hypothesized that Gear-Up support would contradict the brain deficit caused by little academic support, poor diet, irregular sleep patterns, fear, and stress that literature supported as having a direct effect on brain function. Based on the data provided, there was no significant difference in test scores between the students involved in Gear-Up and the students not involved in Gear-Up.

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CHAPTER 1

Introduction

Background for the Project

A middle school located in central Washington State had experienced fluctuation in student achievement at the eighth grade level. The school district had been involved with a School Improvement Plan (SIP) for multiple years. Student test scores in math, reading and writing were below average on the Washington Assessment of Student Learning (WASL) test. This placed the middle school in SIP status. The middle school at times almost reached the academic goals of the state. However, recent WASL scores in sequential years had plummeted, indicating a high inconsistency in student achievement which had resulted in continual school improvement status from the state.

There were many variables in the small rural community that had contributed to the lack of student achievement which included problematic home life, ethnic traditions and beliefs, availability of educational assistance, and circumstances associated with generational poverty. In conversations with students within the school system, many replied that there were many other distractions that inhibited achieving academic success.

The Office of the Superintendent of Public Instruction (OSPI) had listed nine common characteristics of high performing schools. The middle school had diligently adopted and practiced these characteristics. There had been specific emphasis on high levels of collaboration and communication, a supportive learning environment, and high levels of community and parent involvement. A few of the programs to involve parents and community were the Parent Teacher Committee (PTC), math and science nights for students and parents to participate, Merit Resources, and Gaining Early Awareness and Readiness for Undergraduate Programs (Gear-Up).

Merit Resources provided individual and group counseling. This counseling could be related to personal issues or mandatory drug and alcohol counseling for the students. The Gear-Up program provided instructional, motivational and monetary assistance to students with the ultimate goal of college admittance upon graduation from high school for participating students.

Statement of the Problem

The problem was that not all students had the option to participate in the Gear-Up program. Due to grant writing with specific demographics being targeted, some grade levels did not have access to the resources provided by the grant such as tutoring, college readiness and other academic supports.

Purpose of the Study

The objective was to find relevant data that supported the idea that students who were involved in the Gear-Up program had higher achievement levels than students who were not involved in the Gear-Up program. Due to the large amount of commitment from both students and parents involved in the Gear-Up program, there needed to be a significant difference in achievement on student WASL test scores, with Gear-Up students testing higher than non-Gear-Up students.

Delimitations

The demographics for the middle school in the 2006-2007 school years included the following. There were a total of 765 students, of which 48.1 % were male, and 51.9 % were female. Demographics included 24.4 %Native American, 2.2 %Asian, 0.4% Black, 66.3 %t Hispanic, and 6.1 %White. Free and reduced lunch percentages were 88 %, 9.3% special education, 19.3 %bilingual, 24.6 % migrant and 0.4 % unexcused absences (Report Card, 2007).

The demographics for the middle school in the 2007-2008 school years included the following. There were a total of 777 students, of which 48.8% were male, and 51.2 % were female. Demographics included 24.5 % Native American, 1.9 % Asian, 1.9 % Pacific Islander, 0.3 % Black, 65.9 % Hispanic and 6.3 % White. Free and reduced lunch percentages were 89.5 %, 10.0 % special

education, 21.4 % bilingual, 29.3 % migrant and 0.1 % unexcused absence rate (Report Card, 2007).

The sample group used in this study or Cohort I was a ninth grade class that was not involved in the Gear-Up program. The comparative class was a tenth grade class that started as a Gear-Up cohort in sixth grade. The comparative class or Cohort II had four years of support and involvement with the Gear-Up program. Cohort II was under the direction of the same facilitator the cohort started with. Test scores were from each cohort's WASL scores that each group took while they were in school during 2006-2008. While the cohort groups were one year apart, students were administered the same test, in the same grade, with the same scoring standards.

Assumptions

The program included parents as a major factor in the improvement process. Parent involvement was expected for the students in the program. If parents or students did not adhere to the involvement protocols of the program they were removed. This process eliminated any families that were not interested in the success of their child through this specific educational avenue. Due to this procedure it was assumed that the data collected may not have included all pre and post data points.

Another assumption was that the monetary incentives increased student and parent participation rates. Though each grant varied in the monetary incentives, these incentives were promoted as a strategy to increase parent involvement.

Hypothesis

Students who were involved in the Gear-Up program who received services that assisted with parent involvement and supplemental academic support scored higher on the eighth grade WASL science test than students who were not involved in the Gear-Up program.

Null Hypothesis

Students who were involved in the Gear-Up program and received services that assisted with parent involvement and supplemental academic support did not score higher on the eighth grade WASL science test than students who were not in the Gear-Up program.

Significance of the Project

The community with many cultures, economic variances among its citizens, gang activities and low educational norms among its population struggled with graduation rates at the high school level. Many students had a higher level of education than their parents by the time they were in middle school. Many families had negative experiences with education when they were young which

caused a mistrust of the school system. The residents who were over 25 years old in this community included those with a high school diploma or higher at 40.3%, a bachelor's degree or higher at 6.4%, a graduate or professional degree at 1.4% and those unemployed at 33.3% (City data, 2009).

Evidence of graffiti dominated the buildings, signs, vehicles, businesses and homes around the city. The downtown area was mostly void of businesses. Gang activity was prohibited in the schools although very visible throughout the community. Parents attended school events wearing gang-related clothing or adorned with gang- related tattoos down or across their necks and other body parts. Statistics from the local police department showed that there was a strong correlation between the likelihood of students joining a gang if there were familial ties to gangs in the area.

Absenteeism was prevalent in the school district. Reasons for absenteeism ranged from familial duties as an older sibling to chronic illness because of poor living conditions. There were many homes that had only one parent. These homes utilized their children to help keep the household functioning. The majority of the population in this community lived at the poverty, or below poverty level (City data, 2009).

If the results of the project supported the hypothesis, more students may have been encouraged to believe that they could rise above their respective environments and become educated, successful citizens. Gear-Up could become a catalyst for many students to obtain a high school diploma, college education and a career that was fulfilling. The parent dynamic to Gear-Up would have assisted parents to better help their own children. The effort necessary to be a part of Gear-Up by both students and parents would have proved to be worth it.

Procedure

The two cohorts tested were a ninth grade class that was not involved directly with a Gear-Up program, Cohort I, and a tenth grade class that started as a Gear-Up Cohort II. The tenth grade cohort was under the same facilitator's guidance from the cohort's sixth grade year in school.

The WASL test scores of random samplings were evaluated. The random samples were from each group's eighth grade WASL results in the science section of the test. The scores from thirty students were selected in no particular order. All participants were eighth grade students at the middle school at the time of testing which was the spring of 2007 and spring of 2008.

The scores were chosen by placing all student names into a bowl and drawing a random sample of fifteen males and fifteen females. Those individual scores

were then entered into the data pool. Ethnic groups included in the pool consisted of Native Americans, Filipinos, and Hispanic and Caucasian students.

The data was analyzed for each cohort and reported. The use of the Statpak software provided by Heritage University was used to organize and present the information.

Definition of Terms

Annual Yearly Progress. Annual Yearly Progress was defined as the progress that each school made on an annual basis. The measurement tool that was used for this was the WASL test that each state created based on its standards.

Essential Academic Learning Requirements. Essential Academic Learning Requirements were standards adopted by the State of Washington to help school improve curricular focus in every subject area.

Gear-Up. Gaining Early Awareness and Readiness for Undergraduate Program, developed by the University of Washington, helped promote secondary education for under- privileged students.

No Child Left Behind Act. Passed into law in 2001, the No Child Left Behind Act contained high standards for all students including students that qualified for special education.

professional learning community. This was an ongoing process through which teachers and administrators worked collaboratively to seek and share learning and to act on their learning, their goal being to enhance their effectiveness as professionals for students' benefit.

standardized test. Standardized tests were achievement tests with certain distinctive features, including a fixed set of test items designed to measure a clearly defined achievement domain, specific directions from administering and scoring, and norms based on representatives groups of individuals like those for whom the test was designed.

Acronym

Gear-Up. Gaining Early Awareness and Readiness for Undergraduate Program.

NTAC. National Technical Advisory Committee

OSPI. Office of the Superintendent of Public Instruction

PLC. Professional Learning Community

SIP. School Improvement Plan

TAC. Technical Advisory Committee

WASL. Washington Assessment of Student Learning

CHAPTER 2

Review of Selected Literature

Introduction

The articles reviewed in this chapter defined the underlying circumstances that physically caused a negative effect on student learning. The research linked poverty with lower achievement levels in the majority of all school- age children. There were not only stress responses that occurred in the body but also chemical changes in the brain when a person was under continual stress or functioning with fear. Educators and scientists were devising methods to help increase mental stimulation in students exposed to the culture of poverty.

The review of the selected materials in this chapter was organized to address the following topics; poverty and effects on student learning, brain activity and learning ability, Washington State Gear-Up, and The Washington Assessment of Student Learning.

Poverty and the Effects on Student Learning

Many children who lived in poverty also lived in fear. This fact was a basis of stress. There were fears ranging from adequate shelter to comparative standards with what peer groups of students deemed acceptable. Students often were stressed about not having the popular style clothes or most up-to-date hair styles

within the author's sample group. This did not even include personal issues of poor diet, substandard living conditions and different responsibilities that a family in survival mode must endure. People who lived in poverty often had to overcome a multitude of socio-economic issues. Some of those issues could be overcome; some of those issues could not be overcome. "Growing up poor may require a student to have poor attendance, less self-esteem and less optimism toward success in school" (Farah, 2006, p.46).

Students who attended schools in low income areas often had less materials and financing of education available to them. Many school facilities were lacking in an impoverished district. There were not as many support materials or modern learning tools available. Levies and school bonds were not as likely to be supported when a population was already over-extended on every dollar that they earned. Renting was more frequent in a low income community as opposed to owning a home. Taxing supported a large part of school levy money. A direct result of little money coming into a district was worn and dilapidated buildings, old and worn text books and less student supportive programs. Student and staff morale was not positive or supportive. Students often lacked proper school supplies and functioned with mere basics.

Poverty caused stress and depression in children as well as adults. Studies linked poverty in school-age students to low academic achievement. “Brain science is showing how these emotions have effects on the brain and how they can directly impede learning” (Clandos, 2008, n.p.). Studies had been done on laboratory rats to show how stress affects brain activity. All people experienced different levels of stress. People raised in poverty usually experienced higher levels of stress than middle or upper classes of people. Some of the consequences of stress on the brain and related activities were suppressed electrical activity, decreased efficiency and reduced new cell growth (Jensen, 2008).

Fear was closely related with stress in low income families. There was fear of not achieving passing grades, fear of not being able to change their current existence and fear of not being able to progress academically because of monetary issues. This fear was partly justified according to studies. In an issue of Brain Research, Farah (2006) reported that growing up in poverty affected thinking processes associated with several brain systems. Sixty healthy middle school students, matched for age, gender and ethnicity but of different socioeconomic status, took tests that challenged brain areas responsible for specific cognitive abilities. “Researchers found that children from low-income homes had significantly lower scores in areas of language, long-term and short-term memory,

and attention" (Clandos, 2008, n.p.). The mentioned characteristics were all something usually observed in high achieving students.

Kandel (2007) in his article on cells and molecular biological studies of memory storage supported the hypothesis that there was an actual physiological connection that related effects of poverty with a learning deficit that was from inside the brain, not due to student effort. There were many variables linking poverty to low academic achievement. "Behaviors and thoughts that relate to hope, love and happiness can change the brain-just as fear, stress and anxiety can change it… It's completely symmetrical" (Kandel, 2007, n.p.).

Those variables included nourishment, schedule, consistency, encouragement, spirituality, positive feedback and support through mentor and academic programs. Stress and hopelessness were surmountable if hope and realistic avenues were available. Kandel's (2007) research supported that diet was a key element to supplying the brain with nutrients needed for growth. Many homes that were low income had governmental food assistance, in the form of food stamps and commodity foods. The foods that were bought with these supplemental programs were often not fruits and vegetables. They were not the foods that were high in vitamins and minerals. They were not foods optimal for growth of young bodies and minds. "Without accurate cell nourishment, the brain is physically

unable to function in the highest order of memory or retention" (Kandel, 2007, n.p.). This was an aspect directly related to learning and being able to project knowledge at a later date. If a student could not retain information or data, they were not able to demonstrate that they ever were introduced to the material previously. Kandel (2007) stressed that positive interactions in a person's life helped compensate for some external hurdles. If those positive interactions never took place, it was unlikely that the brain ever adapted and functioned at full potential.

Other external factors that caused an effect on brain function often included adequate sleep and this sleep happening in a consistent pattern. Research showed that sleep deprivation often did not supply the brain with a shut-off period so the brain was able to eliminate worry and stress for at least six to eight hours at a time. A tired brain was shown to lead to more stress and more worry.

Spirituality, mentorship or other forms of emotional support were variables that helped neutralize some of the effects of poverty. Any beliefs in positive strengths were shown to help the brain function at a higher level. This support alleviated stress-related conditions as people who believed in a positive power, during the research, often left their stresses and fears to a higher being. This

allowed a healthier mind within a holistic style of growth within the brain. The good overpowered the bad despite the socioeconomic factors.

In the book, *How People Learn*, by John D. Bransford, Ann L. Brown and Rodney R. Cocking (2000), the authors' hypothesis that environment was crucial to how a student performed was supported with references to how important it was to connect a community to a classroom. "It is easy to forget that student achievement in school also depends on what happens outside of school" (Bransford, Brown & Cocking, 2000, p. 224.) The section the authors felt was in alignment with the research included factors such as technology, mentoring and teacher responsibility to reach out as having a direct impact on student achievement. Research supported that low-income parents were as likely to call a school for student progress as parents from a higher socio-economic background (Bauch, 1997). While this was not as drastic a statement as some of the resources the author used to support that poverty and its effects often lowered student achievement, it did demonstrate that if low income parents had the same access to resources in a school district, they would have been just as promotional of their child's achievement. Often, the lack of privileges to students and their parents, due to poverty, made student achievement and parental involvement harder and thus inhibited learning.

Brain Activity and Learning Ability

The book, *Enriching the Brain: How to Maximize Every Learner's Potential* by Eric Jensen (2006), also offered support to the concept that a person's environment has a significant impact on brain activity and learning ability. "The brain grows with positive experiences. Negative experiences, if they are not managed properly, stunt the brain's ability to grow" (Jensen, 2006, p.24). Jensen argued that chronic exposure to poverty caused the brain to change physically in a detrimental manner. The author used this prognosis to evaluate if the test scores from students that were supported and encouraged by school support systems and home were higher than test scores from students who did not have the support. This was the foundation of Gear-Up student scores versus non Gear-Up student test scores. Jensen (2006) focused on not only poverty-ridden students but also learning-impaired students. "The bottom line is we have far more to do with how our children's brains turn out than we previously thought" (Jensen, 2006, p.25). Support and structured environments caused student brain function to be at a higher level than brain function from students of the opposite spectrum.

Test samples that had been given to laboratory animals further supported the theory that effects of poverty caused an effect on learning. Laboratory rats were found to have a vertebral cortex that showed a measureable difference in weight

and thickness between rats that were human raised and then placed in controlled environments. The rats that were placed in an enriched environment filled with changing objects for play and exploration performed higher than the rats that were placed in standard laboratory cages (Rosenzweig & Bennett, 1978). The rats were raised the same as infants but put into the environments with different variables as adults.

Washington State Gear Up

The Gear-Up program was an extension of the Washington Higher Education Coordinating Board. The motto of Gear-Up was, "At Gear-Up, we believe that with the right tools and support, all students in Washington State can go to college" (Gear-Up Handbook, 2008, p.3). Gear-Up started to target students in the middle school range. Gear-Up was an active organizational support system for some of the Cohort II students. These students and their families were actively participating in a program that guided them down a path aimed at success after high school.

The Gear-Up Handbook systematically guided students through their middle school years with the objective of attending college after students completed high school. There were data graphs from the Bureau of Census reports depicting wages earned from high school dropout averages to wages earned by obtaining a

professional degree. These benefits were thoroughly and regularly detailed in multiple formats throughout the handbook.

The handbook followed a step by step format that was easy to understand and age appropriate. Step one encouraged students to discover themselves and their special traits. There were web sites listed to encourage interest inventories for student use.

Step two assisted students in the exploration of their options. The message in the handbook was direct and realistic. “With hard work and planning, it is possible to earn a living doing exactly what you like” (Gear-Up Handbook, 2006, p.6). There were career pathway details and resources. Collaboration with multiple agencies such as the U.S. Bureau of Labor and Statistics, student guidance counselors and the public library were listed. Resources were offered for students with diverse abilities of utilizing searching techniques. College degrees were defined in a brief but complete format.

Step three defined SMART GOALS identified as specific, measureable, achievable, relevant and tailored, and what a student should have done to set a SMART GOAL. This was a shorter section that led directly to Step four.

Step four directed students towards classes they should have considered for high school. Sample graphs were provided to demonstrate school course plans.

One goal the author felt was a good example of the Gear-Up mentality was, "No one is going to do it for you, but teachers, school officials, parents, guardians, and friends are there to help you achieve your goals" (Gear-Up Handbook, 2008, p. 8). The last step of the Gear-Up Handbook was simply a checklist for grades six through eight.

Washington State Assessment of Student Learning in Science

The Washington State Assessment of Learning (WASL) in science was a state test that was originated to measure student knowledge in grades 4, 8 and 10. The test was originated by stakeholders that included science teachers, parents, specialists, learning institutions, business people, students and miscellaneous other interested professional people. The validity of the WASL was proven and accepted in 2004 by the Technical Advisory Committee (TAC). The findings from TAC were that, "the level of validity and reliability for reporting individual student and school results is acceptable…" (Washington Learns, 2004, n.p.). There was a need to have a standardized assessment in science. Science, not considered a core subject, had no set assessment that was administered state-wide. The test adhered to grade level expectations in learning and set a high bar for learning science standards.

The areas the science WASL focused on were concepts and processes, inquiry and problem solving, nature of science and technology, and society problems. The questions on the WASL aligned with the science grade level expectations that were set by the Office of the Superintendent of Public Schools. The test was viable, fair and appropriate as a control.

Summary

The test groups used by the author to collect data were from a low income demographic region. There were many dysfunctional families and students that did not view academics as a priority. According to the research reviewed, in a test group that experienced fear and stress from the effects of poverty, the scores would be lower. As supported by Rosemary Clandos (2008) in *Fear, Stress Among the Poor Hinder Learning*, the socioeconomic needs were an insurmountable hurdle to high test scores in the students without the ability to demonstrate long and short term memory skills or the ability to stay at attention. The author's research was further supported by the work of Dr. Eric Kandel (2007). This study was written from research completed at the Howard Hughes Medical Institute. Cellular function in the brain was proven to impair learning ability when the brain was not nourished by love, happiness, healthy food and regular sleep patterns. Kandel's (2007) work supported the concept that, although

people would still live in poverty, they would be able to reverse the negative brain effects if they developed the healthy life patterns and incorporated spirituality and support into their lives.

Kandel's (2007) work supported both variables from the author's test groups. The author used a group that fit into the poor diet, improper sleep, stressed dynamic. The opposing test group was of the same socioeconomic background; the different variable was that Gear-Up was a large support factor in the second group's academics. The support did not only come from Gear-Up for these students, but the family members of the student had to volunteer and be accountable to support their child as well. The Gear-Up Handbook clearly explained that the organization would help any student who invested the requirements to the program. Jensen's philosophy in his multiple writings was that every learner was enabled or disabled, to a certain extent, by the people involved in his or her education.

The cumulative research material supported a hypothesis that students in Gear-Up would have more emotional and academic support than students without parental and academic support. The results of these differences were both emotional and physiological with a direct effect upon the brain. This was enough

data to substantiate the author's hypothesis that students active in the Gear-Up program would test higher on the WASL than students not involved in Gear- Up.

CHAPTER 3

Methodology and Treatment of the Data

Introduction

The hypothesis of this project was that students who were involved in the Gear-Up program would score higher on the eighth grade WASL science test than students who were not involved in the Gear-Up program. One study group had cooperative support between parent, school and supplemental staff of Gear-Up. The other study group did not have a support system as coordinated with specific requirements.

The author used test results from a random sample of eighth grade students from the same community and school. All students were in the eighth grade when tested, and the scores were based on the WASL results in science only. One sample test group of students had been immersed in the Gear-Up program since their sixth grade year. The other test group was not involved in the Gear-Up program.

Methodology

The author used a quantitative experimental research method where at least one independent variable was manipulated (Gay, Mills & Airasian, 2006). The correlation used in this study was a Pearson Product Moment. The Pearson

correlation was used to establish the relationship between WASL scores of Gear-Up students tested in eighth grade and students not involved in Gear-Up tested in eighth grade at statistically significant levels.

Both groups were administered a WASL test in May of their eighth grade year in school. The control group X (Cohort I) was administered the WASL test in May 2008. The treatment group Y (Cohort II) was administered the WASL test in May 2008. Only the science scores of both groups were used for the experiment.

Participants

The author used the scores from eighth grade science WASL test subjects. All students were enrolled at the same central Washington school. The demographics for this school were low income and diverse in culture. The participant's age range was between 13-15 years old. Ethnicity of the participants included Native Americans, Hispanics, Caucasians, and Filipinos. Test groups consisted of an equal amount of males and females, fifteen of each. Fifteen of the participants were active in the Gear-Up program while fifteen participants were not active in the Gear-Up program.

The author was the eighth grade science teacher of some of the students, but not all. The author chose participants at random after determining a pool to select from that included Gear-Up and non-Gear-Up participant students. There were

two other science teachers the participant groups possibly had for their eighth grade year.

Instruments

The WASL test provided the data that was used by the author. Scores from 15 students that were active in the Gear-Up program at the school were used as were the 15 scores collected from students that were not involved in the Gear-Up program while they were in eighth grade at the same school. All test scores were from random students' science portion of the test when they were in their eighth grade year. A total of 30 scores were used that belonged to students that were WASL tested in science during their eighth grade year.

Design

The WASL test was an experimental study to determine if students had reached the Washington State standards that were expected at different grade levels by all students state-wide. The test school district administered the science portion of the WASL to eighth and tenth grade students. This was in accordance with state-aligned testing windows and criteria. Students always scored well below state average in eighth grade, and tenth grade scores were even worse. There was a very gradual increase year to year, but scores remained very far below state average all the same.

Procedure

The author collected 2008 WASL scores from the eighth grade student Washington State test results. The names of the participants were compared to a roster provided by the Gear-Up program. All Gear-Up enrolled students were identified and placed into a container. The name also included the WASL science score. From the remaining student names and scores the author placed all the student data into another container that was labeled as students not involved in Gear-Up.

Fifteen names were drawn from container X, the Gear-Up (treatment) group. The student names were cut off the data and just the test scores were recorded. This same procedure was followed for the Y group, non-Gear-Up (control group) program students.

The sample groups were comparable to the population in that they were residents of the same community, and enrolled at the same school during their eighth grade year. As random sample groups the selection was only manipulated in choosing equal numbers of males and females. There was 1:15 probability that a student drawn from the pool could have been a low, medium or high functioning student, a variety of ethnic choices or from any economic status within the same demographic area.

Using this procedure allowed the author to have a random pool of participants that was equal in anonymity and diverse in scores. The procedure eliminated bias from the author.

Treatment of Data

A t-test for independent variables was chosen as an appropriate measurement tool for determining significance between the treatment and the control groups. The researcher used the Windows Statpack statistical software program and the WASL test scores from the May 2008 science data for interpreting data. Significance was assessed for p>at .05, .01 and .001 levels.

To test the hypothesis, which would show a significant difference between group X and group Y, a t-test of independent samples was used to analyze the WASL scores.

Summary

The author collected WASL scores from participants in a low income socioeconomic grouping of eighth grade students. There were an equal number of male and female students selected. There were participants that were not involved in the Gear-Up program and students that were actively involved in the Gear-Up program in the selection pool, in equal number for comparison. There were fifteen

test samples of each of the variables for a total of thirty sample student scores that were used where at least one independent variable was manipulated.

The methodology used was quantitative experimental research. The instrument used was the WASL test that provided the data used by the author. Scores from 15 students that were active in the Gear-Up program at the school were used as were the 15 scores collected from students that were not involved in the Gear-Up program while they were in eighth grade at the same school. The research design was an experimental study to determine if students had reached the Washington State standards that were expected at different grade levels by all students state-wide.

The procedure followed collected 2008 WASL scores from the eighth grade student Washington State test results. The names of the participants were compared to a roster provided by the Gear-Up program. All Gear-Up enrolled students were identified and placed into a container. The name also included the WASL science score. From the remaining student names and scores the author placed all the student data into another container that was labeled as students not involved in Gear-Up.

The treatment of the data was a t-test for independent variables chosen as an appropriate measurement tool for determining significance between the treatment

and the control groups. The author used the Windows Statpack statistical software program and the WASL test scores from the May 2008 science data for interpreting data.

CHAPTER 4

Analysis of the Data

Introduction

The author investigated the effects of supplemental student services on academic test scores, comparing test scores of students who received supplemental support with those who did not. The supplemental service was the Gear-Up program. The test administered was the WASL science test taken in each student's eighth grade year. Students were all from a low income environment and diverse in culture.

Many articles and books supported the negative effect poverty had upon student learning. Research demonstrated that while a student may have lived in poverty the presence of academic, family and spiritual support could nullify the negative brain deficiencies caused when the support was absent. Gear-Up was a positive program that included students and families. Gear-Up offered scholarship incentives and shadowed students from sixth grade through graduation. Another benefit was money for out-of-school learning opportunities and tours of colleges to promote higher education as a reality for all students.

Description of the Environment

The data used was from those selected students' eighth grade WASL scores in science. All students were enrolled in their eighth grade of education at the same central Washington school when they took the test. The community surrounding the school was made up of low income families with 100% receiving free lunch. Ethnic groups included Hispanic, Native American, Filipino, Black and Caucasian. Most families consisted of one parent and multiple children. The largest employer in the community was the school district, and most of the school district employees did not reside in the community where they worked. The majority of the students' families existed on public assistance.

The WASL tests were administered by trained proctors at the school. Test scores could have included special education students. All science students in eighth grade had one of three teachers. The author was one of the proctored test administrators as well as an eighth grade science teacher at the school.

Hypothesis

Students who were involved in the Gear-Up program who received services that assisted with parent involvement and supplemental academic support scored higher on the eighth grade WASL science test than students who were not involved in the Gear-Up program.

Null Hypothesis

Students who were involved in the Gear-Up program and received services that assisted with parent involvement and supplemental academic support did not score higher on the eighth grade WASL science test than students who were not in the Gear-Up program.

Results of the Study

The thirty scores that the author used for analysis were shown in Table 1. Group X was the treatment group scores that included all students involved in the Gear-Up program. Group Y was the control group that included all student scores of students not involved in the Gear-Up program at the school. The data suggested the two groups' scores were not significantly different. The two tested groups were comparable. The mean of the treatment group (X) was 370.87 while the mean of the control group (Y) was 383.20.

Table 1

Eighth Grade WASL Scores

Treatment Group		Control Group	
Student	score	Student	score
X1	348	Y1	433
X2	382	Y2	362
X3	400	Y3	348
X4	382	Y4	353
X5	358	Y5	406
X6	400	Y6	378
X7	410	Y7	378
X8	353	Y8	432
X9	353	Y9	410
X10	406	Y10	348
X11	378	Y11	386
X12	382	Y12	400
X13	338	Y13	370

X14	285	Y14	375
X15	338	Y15	366

In order to test for a supported hypothesis, the data was treated statistically by performing a t-test for independent groups. The formula was found in *Educational Research: Competencies for Analysis and Application* (Gay et al., 2006, p. 349).

A t value of 1.02 was determined in the statistical analysis (Gay et al., 2006). The means of the treatment and control group were determined by the value of t. The mean of the treatment group was 382.20. The mean of the control group was 370.87. The degrees of freedom were 28. The data suggested that the treatment group had a slightly higher difference in being better scores on the WASL test. Based on this analysis, the treatment group and the control group were determined to not be significantly different. The author concluded that the eighth grade WASL scores for the treatment and the control groups could therefore be compared.

Table2

Statpack Analysis

STATISTIC	VALUES
No. of Scores in Group X	15
Sum of Scores in Group X	5733.0000
Mean of Group X	382.20
Sum of Squared Scores in Group X	2202355.00
SS of Group X	11202.40
No. of Scores in Group Y	15
Sum of Scores in Group Y	5563.0000
Mean of Group Y	370.87
Sum of Squared Scores in Group Y	2078091.00
SS of Group Y	1459.73
t-Value	+1.02
Degrees of Freedom	28

Significance was determined for $p > .05$, .10 and, .001 (Gay et al., 2006). The calculated value of t at 1.02 was .98 less than the threshold value provided by Gay

et al., (2006) at $p > .05$, which was 2.00. There was a very small increase in the treatment scores, but there was no proven significance.

Table 3

Distribution of t

	P		
df	.05	.01	.001
28	1.706	2.479	3.435

The eighth grade WASL science scores were calculated by the author using the Statpack, producing statistics and associated values. The treatment group did not demonstrate significantly higher WASL scores compared to the control group.

Findings

According to the analysis of the data the author concluded that a null hypothesis had been accepted. The Statpack analysis did not show significantly

higher WASL scores for eighth grade science students of the treatment group in comparison to the eighth grade WASL scores of the control group. Significance was determined for $p > .05$, .10 and, .001 (Gay et al., 2006). The calculated value of t at 1.02 was .98 less than the threshold value provided by Gay, Mills, and Airasian (2006) at $p > .05$, which was 2.00. The hypothesis that students involved in the Gear-Up program would score higher on their WASL tests in eighth grade science was not supported. The evidence suggested a slight increase in test scores, but it was not enough of a margin to support the concept that the Gear-Up program, and its benefits, would have been able to counteract the effects of poverty and the direct correlation poverty had on learning.

Summary

The author compiled and analyzed the treatment and control group data. The treatment group were eighth grade students at the time they took the eighth grade WASL science test. The control group was eighth graders at the time they took the eighth grade WASL test. Both groups were students at the same middle school.

In order to test for a supported hypothesis, the data was treated statistically by performing a t-test for independent groups. A Statpack was used to evaluate the data and form a cognitive overview of the data that included the mean, sums of scores, SS of the groups, number of test scores and the t-value. The null

hypothesis that eighth grade WASL science scores of students involved in the Gear-Up program was not significantly different than eighth grade WASL science test scores from students not involved in the Gear-Up program was supported.

The author reviewed selected literature addressing the effect poverty had on brain function. Some of these effects included physiological issues related to poor nutrition, sleep patterns, and fear and anxiety, along with general lack of comfort issues. The articles indicated that a loving supportive environment often produced a higher level of intelligence. The articles also suggested that with family support, monetary worries alleviated, and academic guidance, students would have become more successful.

The procedures used in the study, the data collection, and the treatment of the data were covered in detail. Both the treatment group and the control group were tested when they were in eighth grade at the central Washington school. There were an equal number of males and females tested as well as an equal number of Gear-Up and non-Gear-Up students tested. All students resided and attended school in the same community, which was a high poverty area.

Based on the evidence presented, the null hypothesis was accepted. The eighth grade students involved in Gear-Up did not substantially score higher on the eighth grade science WASL than the students not involved in Gear-Up.

CHAPTER 5

Summary, Conclusions and Recommendations

Introduction

The concern behind the research project was that test scores were below state standards in the science portion of the WASL test. The literature supported the hypothesis that low income students had learning deficits from actual brain and learning issues as well as the socioeconomic dynamics in their environment that influenced their learning.

Summary

The Gear-Up program was very supportive of students in the school in which the author taught. The author wanted to evaluate whether the students involved in the Gear-Up program would test higher on the science portion of the WASL test. Gear-Up required parental support, an upkeep of the student GPA, and economic support a well as emotional and academic support. These were all factors the literature had defined as having a positive influence on brain activity and achievement in students. All of the participants in the experiment were from the same basic demographics and random in selection to keep the data from being biased in any way. There were fifteen students in each test group. The numbers were equal in male /female and diverse in the cultural groups within the

environment. The author had no control to modify diet, sleep patterns and stress factors from within the home. Literature supported these as being significant factors in brain development. However, according to the literature, the introduction of positive elements was also proven to counteract and restore some of the brain activity.

The science portion of the WASL test scores were entered and processed through a statistical Statpack. The evidence did not support the hypothesis that Gear-Up students would have higher test scores than the students who were not involved in the Gear-Up program.

Conclusions

The conclusion to this experiment was that Gear-Up students did not test higher than students not involved in Gear-Up. Selected literature supported the author's hypothesis that students with emotional, academic and poverty issues functioned with a physiological brain deficit. The literature also supported that these traits associated with poverty could be compensated for, or lessened, with the contradicting variables of support, faith and stress-relieving situations. The research done by Kandal (2007) demonstrated clear and precise brain activity differences between brains with less stress and the effects of poverty as opposed to brains that were immersed in the commonalities of poverty. These

commonalities were stress, fear, poor nutrition and irregular sleep patterns. The literature by Clandos (2008) and Farah (2006) combined with Jensen's works supported this analysis of poverty and the effects it had on learning.

The Statpack data that was provided when the author calculated random student test scores contradicted the hypothesis. Results from the Statpack analysis supported that Gear-Up students did not score substantially higher on the eighth grade WASL science test administered at the school in May 2008. There was no support for the hypothesis on the distribution of t data. The null hypothesis was supported.

Recommendations

The author would recommend that a broader research base might produce a different outcome. Several factors may have provided less than accurate results. The use of only one test in only one subject matter may have been too narrow to provide accuracy. The literature used data that extended over time and included emotional variables as well as physical support. The Gear-Up program was a positive factor for the students in the tested school, but it was only one small variable as opposed to a much greater problem. The author would recommend that the same test groups be assessed in time increments of five years, ten years and fifteen years from now to see if there were any significance differences in the two

participant groups. The assessment would not be of one test, but factors that would include, but not be limited to, type of employment, secondary education experiences, legal history and family dynamics.

If Gear-Up students took advantage of the college grants available upon graduation there should be a number of those participants with post high school education. According to the literature and research, this higher degree of education should alleviate stress, fear and the other negative variables caused by poverty. Some of the WASL test scores of students involved in Gear-Up were equal to or higher than students not involved in the Gear-Up program. Follow- up research on those higher scoring participants and their post high school education would possibly have shown a difference in college attendance.

Another variable to the results of this project would be life circumstances. Eighth grade students would have undergone a broad array of changes by the time they completed school. The WASL test only provided data on two days of testing of a student on very specific dates. The students may have performed with entirely different results on any other day. According to the literature, the common issues of poverty that affect brain function were often sleep, stress, nutrition and fear. More accurate results would be obtained with all test participants having the same amount of sleep, the same meals and the same amount of stress for at least one

day before testing. If there were a wide discrepancy with any of these variables among the participants, the data would be in question. The author would suggest all variables be identical as much as possible and data be observed over time with multiple assessments as opposed to one assessment in one time frame.

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