SCHOOL SIZE AND
STUDENT ACADEMIC ACHIEVEMENT
IN IDAHO HIGH SCHOOLS

by

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ABSTRACT

The purpose of this study was to determine whether or not a relationship existed between school size and student academic performance in Idaho high schools. This study used the mathematics portion of the Idaho Standards Achievement Test (ISAT) taken by all 10th grade students in the spring of 2009 to compare academic achievement in students in small schools and students in large schools. Mean scores for proficient and advanced students were calculated and categorized into five school size classifications. For instance, 91% of all Boise High School (BHS) 10th grade students demonstrated proficiency in mathematics on the ISATs. In 2009, BHS had more than 1280 students and was categorized into the 5A school classification.

The findings in this study offer suggestions about possible variables that affect student academic achievement in small and large schools; including, male and female students, attendance, resources and programs, and economic status.

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CHAPTER ONE: INTRODUCTION

Purpose of Study

As a student and as a teacher, I have been exposed to both small- and large-school environments. My high school graduating class had fewer than 35 students, typical class sizes were about 11 students, and I developed great relationships with my teachers. (I still stay in touch with many of them today.) My father's career—metallurgical engineering—often required my family to move, and as a result, I also spent time at a much larger school. The atmosphere was quite different: the graduating class had over 400 students, class sizes averaged 25 students, and I barely knew most of my teachers. During the course of my teaching career, I have had similar experiences at both ends of the spectrum: at a relatively small school of several hundred and at the largest high school in Oregon's capital city, Salem.

While learning and teaching in these different environments helped shape my educational philosophy, it was not until I became a parent that I really began thinking critically about whether one environment offers more advantages over the other. More specifically, which backdrop—large school or small school—resulted in better performing students? Given a choice, where would I enroll my own children?

The purpose of my research—including a review of available literature and an in-depth look at 2009 Idaho Standard Achievement Test (ISAT) scores for Idaho 10th grade students—is to determine whether or not a relationship exists between school size and student performance.

My first step in exploring this relationship was to better understand the standard mechanism for evaluating student performance in Idaho schools. With the enactment of the No Child Left Behind Act (NCLB) in 2001, standardized testing became a primary method for measuring student performance. As I have focused my curiosity over the last several years, I have looked more closely at standardized test results and their relationship to school size.

Although there is a significant amount of research analyzing student performance (Marks & Cox, 1984; Matuga, 2009; Cerezo Rusillo & Casanova Arias, 2004), there is still a need for more concrete test results. It is necessary to define the effects of environmental, psychological, and sociological elements. This clarity will better enable schools to provide a quality learning institution – an organized and established public domain, with a sphere of knowledge, influence, and activity (Merriam-Webster Dictionary). In recent years there has been an increasing drive to improve student achievement for all students. The NCLB Act enforces accountability in students, teachers, and schools. As part of NCLB, all states are required to evaluate student proficiency through standardized tests (U.S. Department of Education, 2001). These tests determine achievement levels for every student based on developmental proficiency, in areas such as language arts and mathematics. The drive for improving student achievement attracts a growing interest in the influences on academic performance.

In order to better understand the skill levels of students, it might be necessary to evaluate factors affecting their performance. These factors can include: school structure and organization, teacher quality, curriculum, and teaching philosophies (Driscoll, Halcoussis, & Svorny, 2003). The idea that school size might affect student performance

is consistent with the growing literature on the relationship between public sector institutional arrangements and outcomes (Moe, 1984). The purpose of this study is to further examine the relationship of school size and student academic achievement. A key element of this investigation will be the evaluation of student proficiency on federally mandated assessments, while the focus will be on high schools in the state of Idaho and whether or not there is a correlation between the size of the school and achievement levels on the Idaho Standards Achievement Test (ISAT).

The ISAT is an important component of the statewide assessment system (Idaho State Board of Education, 2008). Initiated by the NCLB Act, it is a state-required competency measure of Idaho content standards. The ISAT is administered to students in grades 3-8 as a form of monitoring, measuring, and assessing student, school, district, and statewide progress. Students in grade 10 take the ISAT to verify academic proficiency required for high school graduation. The test is comprised of four sections, including mathematics, language arts, reading, and science; although, proficiency in science is not yet mandatory for graduation. Each category measures standards, goals, and objectives pertinent for each grade level. Due to the numerous components and large scale of the ISATs, this study will only analyze test results from the mathematics portion of the test.

The mathematics section measures competency among five reporting categories: Number and Operations; Concepts and Principles of Measurement; Concepts and Language of Algebra and Functions; Principles of Geometry; and Data Analysis, Probability, and Statistics. The analysis will include data provided by the Idaho State Board of Education, reporting ISAT results from 115 high schools in the state of Idaho. These schools have been grouped into six categories based on the number of attending

students. This size categorization is shown in Table 1. This study examines the relationship of the size of Idaho schools and achievement levels using data from the 2009 Spring ISATs.

Table 1. 2008-2010 CLASSIFICATION AND ALIGNMENT

5A (20) *1280 & over*	**4A** (21) *1279-640*	**3A** (25) *639-320*	**2A** (23) *319-160*	**1A** (37) *159 & below*
Boise	Blackfoot	American Falls	Aberdeen	Carey
Borah	Bonneville	Bear Lake	Butte County	Cascade
Caldwell	Burley	Bonners Ferry	Declo	Castleford
Capital	Century	Buhl	Firth	Challis
Centennial	Columbia	Filer	Glenns Ferry	Clark County
Coeur d'Alene	Emmett	Fruitland	Grace	Clark Fork
Eagle	Hillcrest	Gooding	Grangeville	Council
Highland	Jerome	Homedale	Kamiah	Deary
Idaho Falls	Kuna	Kellogg	Malad	Deitrich
Lake City	Lakeland	Kimberly	Marsing	Garden Valley
Lewiston	Middleton	Marsh Valley	Melba	Genesee
Madison	Minico	McCall-Donnelly	New Plymouth	Hagerman
Meridian	Moscow	Orofino	North Fremont	Hansen
Mountain View	Mountain Home	Payette	Parma	Horseshoe Bend
Post Falls	Nampa	Priest River	Potlatch	Idaho City
Rocky Mountain	Pocatello	Salmon	Ririe	Kendrick
Skyline	Preston	Shelley	Soda Springs	Kootenai
Timberline-B	Rigby	Snake River	Valley	Lakeside
Twin Falls	Sandpoint	South Fremont	West Jefferson	Lapwai
Vallivue	Skyview	St. Maries	West Side	Liberty Charter
	Wood River	Sugar-Salem		Mackay
		Teton		Meadows Valley
		Timberlake		Mullan
		Weiser		North Gem
		Wendell		Notus
				Oakley
				Prairie
				Raft River
				Richfield
				Rimrock
				Rockland
				Shoshone
				Timberline-W
				Troy
				Victory Charter
				Wallace
				Wilder

CHAPTER TWO: REVIEW OF LITERATURE ON SCHOOL DISTRICT SIZE AND ACADEMIC ACHIEVEMENT

Introduction

Many studies (Januszka, & Dixon-Krauss, 2008; Pedder, 2006; Rubenstein, Schwartz, Stiefel, & Zabel, 2009) have examined the effects of class size in relation to academic outcomes. However, few resources compare school size to student achievement. Interest in the topic is growing among parents and educators, and the demand for more information is increasing. In addition to the direct correlation of school size to student performance, other determining factors may influence this relationship (Heck, 2007). These factors include: financing, transportation, communication, socioeconomic status and population density, attendance, classroom equipment, and even teacher quality. Another contributing factor is the reality that many schools differ significantly in organization, structure, curriculum, and methodologies. This portion of the study will review the literature analyzing those factors that have both a positive and negative effect on the impact of school size on student achievement.

Keep It Small

As with many issues in education, small schools and small school districts have both supporters and critics (Borland, Howsen, & Trawick, 2005). However, recent studies show the positive attributes are gaining recognition, and support for small schools is growing (McRobbie, 2001). Sociological theory suggests that as an organization grows,

human interactions and ties become more formal (Weber, 1947). When schools and districts become large, a new structure develops and the relationship between individuals becomes less personal. Some researchers suggest that a large school district size can have a negative effect on student performance (Newman, 1992; Maxner, 2005). If district level decisions limit local school autonomy, the heterogeneous needs of pupils in large districts might not be met (Driscoll et al., 2003). This can result in large schools having poor communication between parents and schools and contribute to creating problems and reducing accountability.

Another factor influencing student achievement is attendance (Jones, Toma, & Zimmer, 2008). States typically allocate budget appropriations to schools based on average daily attendance (ADA) (California State Department of Education, 1980). In the state of Idaho, ADA is the aggregate days of attendance of a school district during a school year divided by the number of days that school was in session (Idaho State Department of Education, 2009). Although larger schools may have an increase in state funding due strictly to numbers of students, some studies suggest student achievement may not necessarily improve. Jones et al. (2008) found that the size of high schools and the size of school districts were inversely related to the rate at which enrolled students attend.

As schools grow, there is an associated need and cost for monitoring the ADA, and making sure students are in school. Due to these increased expenses, schools are less likely to monitor attendance efficiently; consequently, student achievement drops. Several states have now implemented exit exams as a requirement for graduation. During the 2007-2008 school year, 23 states required students to take and pass those tests to

receive high school diplomas (Zabbala, Minnici, McMurrer, & Briggs, 2008). Significant numbers of students are at risk of failing and leaving school without a diploma (Civil Rights Project, 2000). As a result, larger schools showed higher dropout rates than smaller schools because many students failed to make academic progress.

Many supporters of large schools including Witcher & Kennedy (1996) and Haller (1992) believe money received from ADA can be used to offer specialized programs, better classroom instruction, and additional learning materials. However, more programs may not necessarily generate improved student achievement. Quantity is not a replacement for quality. The value of offering a wide range of specialized courses might be overstated, and that a small school with a strong required core curriculum could produce student achievement at high levels (Howley, 1994).

Researchers have also pointed out that the anonymous character of large comprehensive schools contributes to alienation and a lack of intellectual engagement among students (Newman, 1992; Steinberg, 1996). Although one of the aims in increasing school size is to offer more comprehensive programs, the social needs of students may be neglected (Maxner, 2005). Often larger schools have larger class sizes. A teacher may see as many as 200 students in six 50-minute classes each day. It can be difficult for teachers to provide a meaningful learning experience to all their students in such a crowded classroom. Larger classes need additional support to help maintain order. More students in a class can mean more distractions, leading to less instructional time. Class size significantly affects three instructional strategy variables: amount of time spent working with small groups, amount of time devoted to innovative instructional practices,

and amount of time devoted to whole-group discussions (Rice, 1999). This limitation can diminish the effectiveness of quality learning and therefore inhibit student achievement.

In addition to limits within the classroom, there are other teacher constraints. Stevenson and Stigler (1992, p. 212) raise the question of whether it is "the size of the class per se or the amount of work that is involved in teaching." They argue larger classes my be reasonable if teacher loads can be reduced in other ways, such as additional time for lesson planning, communicating with individual students and their parents, or communicating with their peers. Although class size is still being examined, it seems positive influences suggest smaller schools are more beneficial than their larger counterparts.

Bigger Is Better

Alternatively, large schools may provide some advantages. Conant (1959) believed larger schools were more comprehensive and could better meet the educational needs of students. Current research indicates the drive for larger schools is due to better resources and facilities and more specialized services assumed to exist in large schools (Gardner, Ritblatt, & Beaty, 2000).

As described above, states often distribute funds to schools based on the average daily attendance, which is one contributing reason to the increased support of larger schools. Therefore, these schools can receive more money than smaller schools on the basis of their collective student numbers. This benefit to large schools gives them the ability to spend greater amounts of money on resources for classroom instruction,

including textbooks, computers, and other learning materials. The extra funding can thereby indirectly increase levels of academic achievement (Driscoll et al. 2003).

In addition to instructional materials, larger schools have the opportunity to provide a broad range of classes to meet the needs of their students. Larger schools often have many students with similar instructional needs, which can make it easier for the school to create specialized programs to reach their educational goals. Some research documents a relationship between organizational size and program specialization (Lee & Smith, 1997). These specialized programs can provide an opportunity for students to be more successful. Smaller schools may not have the funding, resources, or teachers available to provide such programs, and thus, less able to accommodate the needs of all their students.

Some studies also suggest that in smaller schools, a larger fraction of the population typically lives in rural areas or very small towns, implying either many small schools or high costs of transportation (Heinesen, 2005). Smaller school districts, therefore, may have different priorities of spending when planning the annual budget. If the district has many small schools, they attain higher costs for building maintenance, such as heating, cooling, cleaning, etc. If the district has only a few schools, it has to make accommodations for the all the families within the district boundaries, including those who may live more than 30 miles away from the school. School districts are required to make transportation available to all their students; therefore, the cost of transportation for rural communities can be very high. The smaller school may have to spend more money per student on buses, gas, drivers, and maintenance. Unfortunately, by providing one service, such as transportation or building availability, the school may not

be able to provide other accommodations to its student body, including additional instructional materials, specialized programs, and technology, all of which can help improve overall student achievement.

Conclusion

An increasing number of studies examine the relationship between school and district size and student achievement. However, the results of these studies have been inconsistent. Slate and Jones (2005) suggest that school size is indirectly related to academic outcomes through its relationship to a variety of other variables, such as socioeconomic status, teacher quality, and state funding. As a result, the connection between school size and student achievement becomes even more complex.

Beyond size, all schools must have a clear mission the teachers, students, and parents understand and find meaningful (Meier, 1995). Teachers must be skilled in the subjects they teach and know how to encourage students to take responsibility for their own learning (Noguera, 2002).

It is apparent that further research is necessary to gain a better understanding of whether or not there is a significant correlation between school and district size and student achievement. Nevertheless, researchers need to consider variables, such as teacher experience, administrative structure, and financial distribution, which can be related to school size and might impact the results of their studies.

The relationship of school size to educational quality remains controversial only because too many researchers and policy-makers seek a yes or no answer to the question, “Are small schools better than large schools?” (Slate & Jones, 2005). More importantly,

what is “better?” Is it student performance and academic achievement? Is it structure and organization? Or is it something more than the makeup of the school, such as the relationships students build with their teachers and their peers? There still is not a clear definition of a better school. But what is certain is the fact that there is an overwhelming desire to improve student achievement. Teachers, parents, students, and even the community are interested in finding solutions. This common demand craves an improved educational system. Although a great deal of research has been conducted, there is a definite need for more.

So, in summary, the available literature is wide-ranging, providing information that establishes a relationship between the characteristics of both small and large schools and student achievement. For small schools, the literature suggests more personal relationships, a higher level of intellectual engagement, better attendance, a strong core curriculum, and more focus on students’ social needs all contribute to an environment that leads to higher levels of achievement. Conversely, others see the broader curriculum, better resources, and more focus on academic programs larger schools provide as being more direct contributors to higher-performing students.

This conflict resulted in my continuing to ask what holds true for schools in Idaho: What, if any, relationship exists between school size and student performance? Until more studies demonstrate results on the basis of the correlation between school size and student achievement, it is important for teachers, administrators, and students to cautiously examine all the factors influencing academic achievement before making any decisions about restructuring, reorganizing, and even student replacement.

CHAPTER THREE: METHODOLOGY

Research Design

This study uses a correlation design to examine 1) the differences in academic achievement in students at small and large schools, 2) gender differences in achievement among those schools, 3) effects of economically disadvantaged students, and 4) teacher quality in small and large schools.

Participants

Subjects for this study are 10th grade high school students and their respective high schools in the state of Idaho. Data will be collected from 115 high schools in the state. The schools have each been categorized based on the number of attending students, (represented in Table 1 above). Students in grade 10 were chosen because ISAT results verify academic proficiency in the state of Idaho, which is required for graduation. The ISAT is made up of four content areas: mathematics, language arts, reading, and science. Currently, academic achievement in science measured through the ISAT is not required for graduation. Each area contains multiple categories of measurement. This study will analyze data only from the mathematics portion of the standardized test.

Data

Student academic achievement was measured by the state's mandated standardized test called the Idaho Standards Achievement Test (ISAT). The ISAT is required to be taken by the state of Idaho and is a method of measuring student progress. Students take the ISAT every spring in Idaho's public schools (Idaho State Board of Education, 2008). The Idaho State Board of Education (ISBE) provides public access to school, district, and state results for the ISAT. The NCLB state report includes scores and demographics for every school in each of the content areas. The report also categorizes proficiency levels in four ranges: advanced, proficient, basic, and below basic. A sample school ISAT report is shown in Table 2. The purpose of this study is to gather the data results of the assessment for each of the 115 high schools and compare mean scores based on the size of the school.

The assessment is administered to every student in the spring. This study will compare and analyze proficiency levels in the area of mathematics from the 2009 test results of 10^{th} grade students. ISBE provides numeric ranges for each of the proficiency levels. These ranges can be found in Table 2. This report analyzes whether or not school size has a relationship to achievement levels of its students based on the numeric proficiency levels.

CHAPTER FOUR: PROCEDURE

To determine whether or not there are any relationships in academic achievement, 2009 spring ISAT scores for 10th grade students in small schools were compared to 2009 spring ISAT scores of 10th grade students in large schools. Mean scores for proficient and advanced students were calculated for each of the five classified groups. Results of those calculations were also divided into sub-categories of the exam to compare distinct groups within each group classification. The sub-categories include: gender, economically disadvantaged students, and teacher quality. To determine the effects of teacher quality in small and large schools, the study compares the percentage of the teacher population holding Master's degrees or higher and the mean salary for each school group.

Table 2. 2008 SAMPLE OF NCLB SCHOOL SCORES AND DEMOGRAPHICS

ISAT
Idaho Standards Achievement Tests

IDAHO STANDARDS ACHIEVEMENT TESTS (ISAT)
NCLB STATE REPORT OF SCHOOL SCORES AND DEMOGRAPHICS
SPRING 2008

GRADE 10

DISTRICT: **KUNA JOINT DISTRICT 003**
SCHOOL: **KUNA HIGH SCHOOL 402**

PAGE: **1**

Proficiency Level Ranges

A = Advanced, **P** = Proficient, **B** = Basic, **BB** = Below Basic

	Reading	Mathematics	Language Usage
A	>234	>250	>241
P	220-234	238-250	226-241
B	211-219	230-237	218-225
BB	<211	<230	<218

	Reading						Mathematics						Language Usage					
	Average Scale Score	Number Tested	% Below Basic (BB)	% Basic (B)	% Proficient (P)	% Advanced (A)	Average Scale Score	Number Tested	% Below Basic (BB)	% Basic (B)	% Proficient (P)	% Advanced (A)	Average Scale Score	Number Tested	% Below Basic (BB)	% Basic (B)	% Proficient (P)	% Advanced (A)
All Students	229	300	4.7	9.7	60.7	25.0	245	300	7.7	18.0	43.3	31.0	230	299	10.0	21.1	54.8	14.0
Male	227	132	6.1	11.4	64.4	18.2	244	132	8.3	18.9	46.2	26.5	227	131	14.5	26.7	54.2	4.6
Female	231	168	3.6	8.3	57.7	30.4	246	168	7.1	17.3	41.1	34.5	233	168	6.5	16.7	55.4	21.4
American Indian / Alaskan Native	*	2	*	*	*	*	*	2	*	*	*	*	*	2	*	*	*	*
Asian	*	1	*	*	*	*	*	1	*	*	*	*	*	1	*	*	*	*
Black / African American	*	1	*	*	*	*	*	1	*	*	*	*	*	1	*	*	*	*
Native Hawaiian / Other Pacific Islander	*	1	*	*	*	*	*	1	*	*	*	*	*	1	*	*	*	*
White	230	268	3.4	9.3	61.2	26.1	246	268	8.2	16.0	44.4	31.3	231	267	9.0	20.6	55.8	14.6
Hispanic or Latino Ethnicity	224	27	18.5	14.8	51.9	14.8	240	27	3.7	40.7	37.0	18.5	225	27	22.2	25.9	44.4	7.4
Other / Unknown	*	0	*	*	*	*	*	0	*	*	*	*	*	0	*	*	*	*
Economically Disadvantaged	227	66	6.1	15.2	59.1	19.7	243	66	12.1	21.2	42.4	24.2	227	66	22.7	21.2	43.9	12.1
LEP	*	1	*	*	*	*	*	1	*	*	*	*	*	1	*	*	*	*
Migrant	*	1	*	*	*	*	*	1	*	*	*	*	*	1	*	*	*	*
Special Education	215	25	36.0	28.0	36.0	0	229	25	60.0	24.0	16.0	0	219	25	36.0	56.0	8.0	0
Title I A	*	0	*	*	*	*	*	0	*	*	*	*	*	0	*	*	*	*

IDSSS1

* Less than or equal to 10 tested students.

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CHAPTER FIVE: DATA ANALYSIS

Results

After collecting all available ISAT test scores of 10th grade student in the state of Idaho, data were organized into tables and categorized based on school size (see Tables 3 through 7 below). Mean scores were then calculated within each of the five divisions (see Table 8) in order to compare student academic achievement among the different school sizes and subgroups within those categories.

Table 3. 2008 AVERAGE SCALE SCORE—5A SCHOOLS

5A **1280 & over**	**All Students**	**Male**	**Female**	**Economically Disadvantaged**	**Special Education**
Boise	90.75	89.66	91.85	77.50	58.06
Borah	78.81	78.22	79.49	72.02	37.50
Caldwell	58.88	60.44	57.55	54.85	12.50
Capital	84.91	86.41	83.54	71.73	38.46
Centennial	88.30	88.24	87.85	76.05	44.74
Coeur d'Alene	86.38	84.58	88.06	71.27	37.93
Eagle	89.40	89.96	88.70	62.06	25.00
Highland	83.43	84.47	82.45	68.29	20.83
Idaho Falls	82.81	83.01	82.56	63.73	29.17
Lake City	79.69	84.35	74.73	72.97	33.33
Lewiston	84.71	85.28	84.13	71.11	35.29
Madison	82.70	81.93	83.42	72.08	30.30
Meridian	79.59	80.56	78.36	61.46	38.78
Mountain View	87.22	85.93	88.52	75.89	43.48
Post Falls	72.83	73.54	72.06	66.45	33.34
Rocky Mountain	86.34	85.64	87.07	79.69	51.85
Skyline	80.22	77.60	83.04	65.84	9.09
Timberline-B	87.25	91.24	83.49	81.82	45.50
Twin Falls	79.64	78.60	80.65	72.25	43.24
Vallivue	75.78	76.70	74.72	69.09	30.30
AVERAGE	**81.98**	**82.32**	**81.61**	**70.31**	**34.93**

Table 4. 2008 AVERAGE SCALE SCORE—4A SCHOOLS

4A **1279-640**	**All Students**	**Male**	**Female**	**Economically Disadvantaged**	**Special Education**
Blackfoot	66.18	69.01	63.08	62.92	10.00
Bonneville	77.09	83.22	70.45	67.93	31.04
Burley	66.92	69.24	64.28	56.17	25.92
Century	87.16	85.56	88.28	74.60	20.00
Columbia	73.81	74.39	73.21	68.10	32.26
Emmett	73.15	73.34	72.94	71.93	31.82
Hillcrest	86.68	91.93	81.49	79.37	38.46
Jerome	78.45	84.73	70.29	69.75	15.38
Kuna	78.55	78.34	78.76	73.96	30.77
Lakeland	92.99	94.49	91.43	82.14	50.00
Middleton	71.37	71.67	71.12	61.91	34.78
Minico	74.12	80.54	67.15	68.05	31.58
Moscow	85.35	86.36	84.09	71.05	46.15
Mountain Home	71.14	70.47	71.81	66.25	38.46
Nampa	70.12	67.65	72.79	68.51	42.30
Pocatello	74.90	74.20	75.54	63.06	24.14
Preston	81.68	80.64	82.65	74.63	-
Rigby	86.06	88.03	84.14	79.16	31.58
Sandpoint	81.96	84.00	80.00	67.09	41.18
Skyview	81.65	80.26	83.33	68.26	20.00
Wood River	81.94	83.62	80.18	62.50	46.67
AVERAGE	**78.16**	**79.60**	**76.52**	**69.40**	**32.12**

Table 5. 2008 AVERAGE SCLAE SCORE—3A SCHOOLS

3A **639-320**	**All Students**	**Male**	**Female**	**Economically Disadvantaged**	**Special Education**
American Falls	64.57	63.08	66.13	52.17	18.18
Bear Lake	81.93	83.79	80.43	77.77	-
Bonners Ferry	85.25	87.72	83.08	-	-
Buhl	78.15	79.66	76.66	69.35	-
Filer	79.24	82.98	76.27	68.29	-
Fruitland	85.60	89.23	81.67	84.00	-
Gooding	76.47	75.76	77.14	80.00	-
Homedale	80.90	73.81	87.23	77.08	-
Kellogg	74.49	70.21	78.44	64.28	-
Kimberly	86.84	86.00	87.50	71.43	-
Marsh Valley	72.00	75.93	67.39	-	-
McCall-Donnelly	93.05	92.85	93.34	100.00	-
Orofino	72.29	75.00	69.23	60.52	-
Payette	68.79	70.58	67.12	67.19	-
Priest River	73.68	73.92	73.33	67.86	-
Salmon	66.28	71.11	60.97	-	-
Shelley	76.44	73.96	79.49	72.37	10.53
Snake River	71.73	62.50	79.02	65.22	-
South Fremont	79.34	73.02	86.21	84.62	-
St. Maries	80.44	87.75	72.09	77.55	33.33
Sugar-Salem	89.69	92.16	86.95	83.34	-
Teton	74.51	67.21	85.37	55.55	25.00
Timberlake	85.82	87.88	83.82	86.96	-
Weiser	78.13	71.21	85.48	76.27	-
Wendell	81.58	85.72	78.05	70.45	-
AVERAGE	**78.29**	**78.12**	**78.50**	**73.29**	**21.76**

Table 6. 2008 AVERAGE SCALE SCORE—2A SCHOOLS

2A **319-160**	**All Students**	**Male**	**Female**	**Economically Disadvantaged**	**Special Education**
Aberdeen	69.23	64.71	74.20	51.35	74.28
Butte County	72.23	63.16	82.35	66.67	-
Declo	79.27	71.05	86.37	52.17	-
Firth	83.68	91.66	76.00	81.25	-
Glenns Ferry	74.19	76.47	71.43	73.91	-
Grace	96.78	95.24	98.32	-	-
Grangeville	85.51	80.95	92.59	80.77	-
Kamiah	80.48	75.00	85.71	87.50	-
Malad	93.15	95.45	89.66	-	-
Marsing	71.93	67.85	75.86	72.42	-
Melba	77.61	80.77	75.61	68.00	-
New Plymouth	85.72	89.13	81.58	78.38	-
North Fremont	86.84	80.00	94.44	85.72	-
Parma	81.08	88.24	75.00	74.41	-
Potlatch	81.48	92.37	70.59	-	-
Ririe	88.88	96.15	78.95	80.00	-
Soda Springs	70.97	69.45	73.08	53.84	-
Valley	79.55	94.12	70.37	74.08	-
West Jefferson	78.73	76.00	81.81	75.00	-
West Side	84.62	85.72	83.33	-	-
AVERAGE	**81.10**	**81.67**	**80.86**	**72.22**	**74.28**

Table 7. 2008 AVERAGE SCALE SCORE—1A SCHOOLS

1A **159-100**	**All Students**	**Male**	**Female**	**Economically Disadvantaged**	**Special Education**
Carey	90.47	100.00	80.00	-	-
Cascade	85.72	-	-	-	-
Castleford	86.95	93.75	-	76.93	-
Challis	81.40	78.26	85.00	84.62	-
Clark County	100.00	100.00	100.00	-	-
Clark Fork	71.43	73.33	-	66.67	-
Council	84.21	76.75	91.67	90.91	-
Deary	100.00	100.00	100.00	-	-
Dietrich	93.75	-	-	-	-
Garden Valley	85.00	87.00	83.34	-	-
Genesee	94.11	-	-	-	-
Hagerman	72.72	72.22	73.33	60.00	-
Hansen	88.46	92.31	84.62	80.00	-
Horseshoe Bend	88.00	82.67	93.33	91.67	-
Idaho City	78.57	71.43	85.71	-	-
Kendrick	73.92	60.33	87.51	-	-
Kootenai	84.21	-	-	-	-
Lakeside	68.18	53.03	83.33	53.85	-
Lapwai	77.50	77.78	77.27	72.41	-
Liberty Charter	85.29	89.48	80.00	-	-
Mackay	88.23	-	-	-	-
Meadows Valley	86.95	89.00	84.61	-	-
Mullan	91.67	-	-	-	-
North Gem	100.00	-	-	-	-
Notus	76.92	78.26	75.00	92.86	-
Oakley	85.00	70.00	100.00	-	-
Prairie	84.84	89.47	78.57	77.78	-
Raft River	90.91	84.62	97.20	81.82	-
Richfield	81.25	-	-	-	-
Rimrock	38.46	54.54	26.67	33.33	70.00
Rockland	78.57	72.72	85.00	-	-
Shoshone	68.08	66.67	69.56	-	-
Timberline-W	75.87	80.00	71.74	77.78	-
Troy	84.21	81.67	86.75	-	-
Victory Charter	92.60	100.00	86.00	-	-
Wallace	72.22	80.96	60.00	-	-
Wilder	72.00	79.30	64.70	75.00	-
AVERAGE	**82.64**	**80.54**	**81.14**	**74.38**	**70.00**

Table 8. 2008 AVERAGE SCALE SCORE—BY CATEGORY

Category	5A	4A	3A	2A	1A
All Students	81.98	78.16	78.29	81.10	82.64
Male	82.32	79.60	78.12	81.67	80.54
Female	81.61	76.52	78.50	80.86	81.14
Economically Disadvantaged	70.31	69.40	73.29	72.22	74.38
Special Education	34.93	32.12	21.76	74.28	70.00
AVERAGE	**70.23**	**67.16**	**65.99**	**78.03**	**77.74**

In order to express the position of each school relative to the others, the schools were ranked in order from highest mean score of all students to lowest mean score of all students. Schools were then categorized into the five divisions based on their sizes. The state average for 10th grade students who showed proficiency on the ISAT was 81.57% (Idaho State Board of Education, 2009). Figure 1 represents the percent of schools in each division whose scores were higher than the state average.

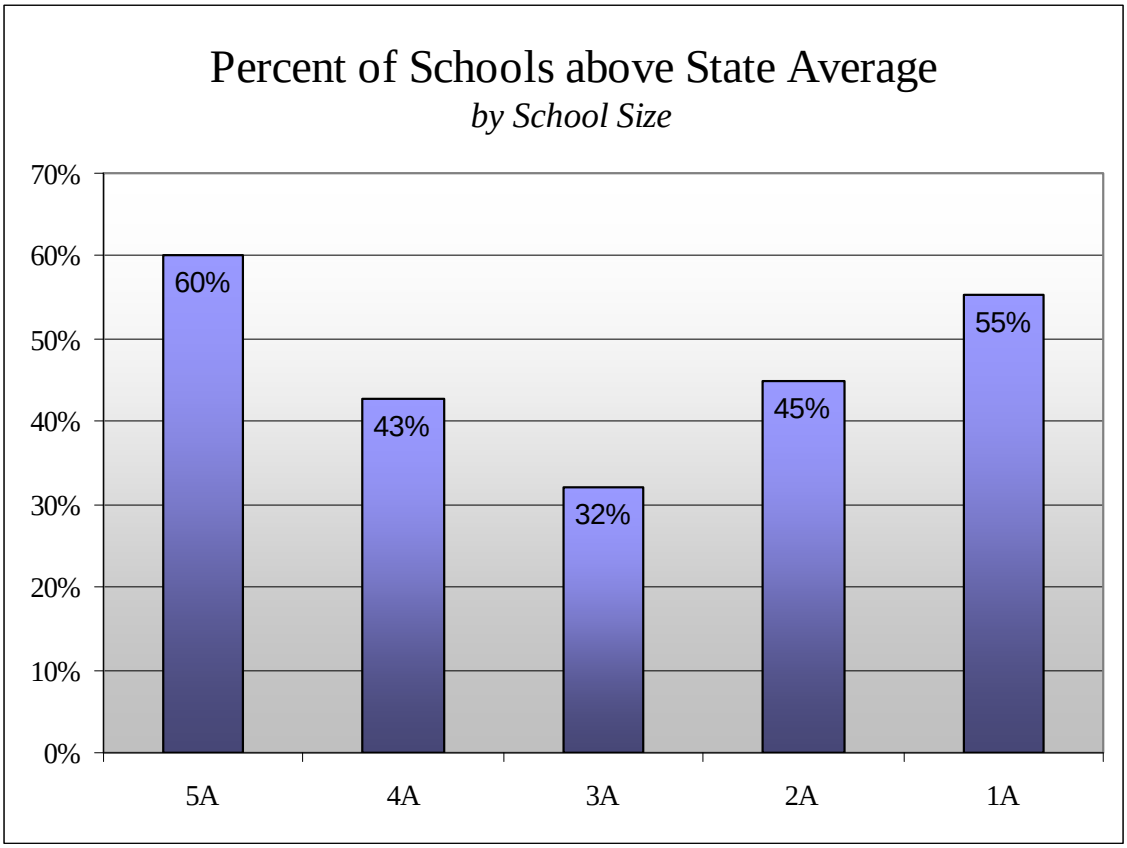

Figure 1. Percent of Schools Above State Average—By School Size

It is important to note that in the fall of 2008, 10th graders were allowed to take the ISAT in reading, math and language usage and "bank" those scores to meet the graduation requirement. More than 18,000 10th graders took the fall 2008 ISAT, with a majority banking their fall scores. Consequently, a much smaller number of 10th graders participated in the spring 2009 ISAT. Therefore, the results displayed on the spring 2009 tables for 10th grade are based on a significantly smaller population of students, consisting primarily, but not entirely, of those students who did not pass the ISAT in the fall of 2008. In reviewing the charts for the fall 2008 ISAT and the spring 2009 ISAT, it is imperative to consider these facts as it will affect: 1) the average scale score, 2) the percent of proficient students, 3) and any conclusions drawn comparing this year's data with previous years (Idaho State Department of Education, 2009).

Discussion

Results of this study show that although there is no statistical significance to the relationship of student academic performance and school size, there does appear to be some practical significance.

The largest schools in the state performed the highest. As stated in the review of literature, the significance between the two factors may be a direct result of the funds schools receive. School districts are allotted state funds for individual students. Each school district is required by law and by State Board of Education regulations to maintain a reporting system for financial and statistical records. The general statistics and the statements of revenue and expenditures by fund of each district represent a summary of the activity for the school year (Idaho State Department of Education, 2009). Because

money is distributed to schools based on the number of attending students, the total of allocated funds is higher at larger schools than at smaller schools. These funds give those schools the capability to provide additional instructional resources within the classroom. They can offer more specialized programs for students with specific educational and developmental needs. The state funds can also be used to provide students in larger schools with a broader range of classes and more diversified faculty. And with a growing population in urban areas, large school districts have the capacity to build newer, more efficient facilities.

State funds in Idaho are allocated through school districts and not individual schools. During the 2007-2008 school year, data provided by the Idaho State Department of Education (2009) show the district with the largest average daily attendance (ADA) as Meridian with nearly 31,000 students. See Tables 9 and 9a. Total state funds for the Meridian school district during that year were close to $160 million. The school district with the smallest ADA was Mullan with 108 students. Total state funds for this district were about $1.4 million. The difference in total state funding for these districts was over $158 million. Although total state appropriated funds play a significant role in academic achievement, data in Figure 1 suggest students can attain high academic levels through the influence of other motivational factors.

Table 9. 2008 SCHOOL DISTRICT FUNDING—ADA 1 THROUGH 52

District Name	Total State Support	Expenditure per Full-term ADA	ADA	District Name	Total State Support	Expenditure per Full-term ADA	ADA
Meridian Joint District	$158,905,589.82	$5,917.00	30,972.16	Preston Joint District	$12,301,126.84	$4,858.00	2,367.39
Boise Independent District	$127,846,696.00	$7,998.00	23,528.54	Moscow District	$12,055,486.87	$7,969.00	2,280.99
Nampa School District	$71,016,931.17	$5,474.00	13,411.68	Fremont County Joint District	$13,366,576.93	$6,206.00	2,223.28
Pocatello District	$59,348,527.77	$5,928.00	11,114.08	Shelley Joint District	$10,694,182.46	$5,233.00	2,011.20
Idaho Falls District	$50,122,104.85	$5,996.00	9,616.06	Snake River District	$10,175,030.42	$5,782.00	1,722.97
Coeur D'Alene District	$50,111,613.38	$6,166.00	9,487.85	Fruitland District	$9,427,258.63	$5,768.00	1,674.11
Bonneville Joint District	$44,954,542.76	$5,201.00	8,575.93	Payette Joint District	$9,908,464.58	$5,875.00	1,615.57
Twin Falls District	$36,675,953.47	$5,453.00	6,996.69	Boundary County District	$9,185,695.95	$6,838.00	1,512.67
Caldwell District	$32,257,177.59	$5,739.00	6,152.14	Weiser District	$8,999,314.73	$6,161.00	1,499.55
Vallivue School District	$31,876,320.05	$5,850.00	5,953.02	Teton County District	$7,961,254.83	$6,149.00	1,476.21
Post Falls District	$26,410,871.96	$5,465.00	5,037.34	American Falls Joint District	$8,908,457.31	$6,999.00	1,456.92
Cassia County Joint District	$27,693,230.19	$5,685.00	4,892.91	West Bonner County District	$8,488,635.44	$6,844.00	1,414.67
Lewiston Independent District	$25,736,751.84	$7,787.00	4,683.61	Kimberly District	$7,493,377.52	$5,469.00	1,370.87
Madison District	$23,709,495.17	$4,966.00	4,404.00	Sugar-Salem Joint District	$7,432,599.35	$5,757.00	1,314.52
Lakeland District	$22,865,729.98	$5,610.00	4,343.72	Filer District	$7,883,913.02	$6,370.00	1,306.20
Kuna Joint District	$21,041,414.64	$5,327.00	4,224.10	Kellogg Joint District	$7,715,987.37	$7,628.00	1,260.37
Jefferson County Jt District	$22,007,594.11	$5,107.00	4,188.14	Homedale Joint District	$7,241,826.79	$5,988.00	1,240.26
Blackfoot District	$21,946,103.53	$6,284.00	3,989.85	Gooding Joint District	$6,913,515.08	$5,715.00	1,221.21
Mountain Home District	$19,829,267.02	$6,284.00	3,897.13	Orofino Joint District	$8,000,684.08	$7,571.00	1,174.30
Minidoka County Joint District	$23,237,778.74	$6,234.00	3,740.38	Marsh Valley Joint District	$7,408,269.20	$6,109.00	1,170.10
Lake Pend Oreille District	$20,900,501.25	$7,352.00	3,567.96	Buhl Joint District	$6,987,588.60	$5,853.00	1,166.70
Jerome Joint District	$17,162,890.74	$5,469.00	3,236.62	St Maries Joint District	$6,777,747.42	$7,093.00	1,092.38
Blaine County District	$16,543,431.20	$13,777.00	2,999.76	Bear Lake County District	$6,973,353.59	$6,812.00	1,081.52
Middleton District	$3,087,317.46	$5,481.00	2,816.53	Mtn View School District	$7,543,626.74	$8,924.00	1,065.87
Emmett Independent Dist	$15,411,023.14	$5,795.00	2,658.77	Wendell District	$6,143,532.71	$6,000.00	1,043.21

Table 9a. 2008 SCHOOL DISTRICT FUNDING—ADA 53 THROUGH 104

District Name	Total State Support	Expenditure per Full-term ADA	ADA	District Name	Total State Support	Expenditure per Full-term ADA	ADA
Salmon District	$5,476,388.94	$6,305.00	913.39	Hansen District	$2,787,090.48	$7,732.00	366.25
New Plymouth District	$5,412,703.17	$6,305.00	890.56	Cascade District	$2,415,317.00	$9,118.00	316.42
Soda Springs Joint District	$5,637,097.41	$7,418.00	863.93	Notus District	$2,413,273.05	$7,025.00	315.52
Oneida County District	$5,263,324.95	$5,927.00	850.82	Troy School District	$2,304,086.00	$9,131.00	306.56
Marsing Joint District	$4,839,431.13	$5,967.00	815.13	Horseshoe Bend School Dist	$2,273,017.61	$8,392.00	297.59
Aberdeen District	$5,064,928.45	$7,064.00	776.70	Genesee Joint District	$2,381,162.24	$6,935.00	296.12
Firth District	$4,440,678.41	$6,007.00	732.00	Castleford District	$2,232,292.24	$9,172.00	266.37
Melba Joint District	$4,303,587.03	$6,351.00	709.36	Whitepine Jt School District	$2,261,811.99	$11,030.00	262.36
Valley District	$4,465,190.24	$6,500.00	640.96	Kootenai District	$2,090,116.21	$9,714.00	258.22
Ririe Joint District	$4,320,666.03	$6,478.00	632.13	Council District	$2,158,511.49	$9,133.00	244.67
West Jefferson District	$4,394,226.43	$7,085.00	595.16	Richfield District	$1,597,586.24	$8,437.00	206.53
Shoshone Joint District	$3,640,436.30	$6,263.00	568.79	Murtaugh Joint District	$1,803,508.64	$7,608.00	205.93
West Side Joint District	$3,421,898.36	$5,983.00	543.83	Mackay	$1,766,486.14	$9,305.00	196.70
Kamiah Joint District	$3,423,936.58	$6,998.00	531.57	Meadows Valley District	$1,617,944.66	$8,861.00	193.42
Wallace District	$3,408,000.66	$8,671.00	514.98	Highland Joint District	$1,848,882.57	$11,930.00	189.28
Lapwai District	$3,377,677.94	$10,059.00	500.48	Dietrich District	$1,736,879.68	$8,393.00	186.42
Glenns Ferry Joint District	$3,368,670.85	$7,482.00	468.58	North Gem District	$1,574,264.11	$10,215.00	164.84
Butte County Joint District	$3,358,883.54	$7,618.00	450.09	Bliss Joint District	$1,549,256.10	$9,001.00	163.96
Challis Joint District	$3,292,783.49	$8,050.00	433.49	Nezperce	$1,625,004.05	$12,715.00	143.50
Grace Joint District	$3,353,850.26	$7,911.00	428.35	Midvale District	$1,646,674.51	$11,059.00	134.22
Potlatch District	$3,282,865.61	$8,716.00	419.06	Slmn Rvr Joint School Dist	$1,587,173.68	$13,483.00	133.76
Plummer-Worley Joint District	$3,109,184.69	$10,574.00	402.10	Rockland District	$1,623,457.54	$12,339.00	132.75
Cottonwood Joint District	$3,084,574.93	$7,910.00	398.86	Cambridge Joint District	$1,467,361.82	$11,193.00	130.03
Basin School District	$2,806,443.14	$7,650.00	397.76	Culdesac Joint District	$1,426,364.51	$15,402.00	113.90
Bruneau-Grand View Joint Dist	$3,221,995.29	$9,149.00	383.92	Mullan District	$1,387,824.40	$14,830.00	108.06

While large schools performed the highest in the state, the smallest schools also had high academic scores. These results suggest that smaller class sizes can provide students with more individual instruction time, which can increase learning retention. More personal relationships with the faculty and administration can motivate students to reach higher academic levels. Better communication among students, parents, teachers and administrators may directly result in higher attendance rates and lower dropout rates; and consequently, indirectly affect higher academic achievement. However, further research into Idaho school finance reveals interesting results.

With an average ADA of 108 students, Mullan school district received nearly $15,000 per student during the 2007-2008 school year. During that same year, Meridian school district received just under $6,000 per ADA. These data illustrate an estimated difference of $9,000 per student. It also shows a very complex calculation for state funding in the state of Idaho.

Recommendations

While results of this study suggest the largest schools (5A) and the smallest schools (1A) have higher academic achievement than those caught in the middle, it is important to note that data from the ISAT is only one indicator of student performance and therefore a limitation to the research. There may be other variables affecting the total quality of an educational experience which were not measured within this study. Suggestions for further research include, but are not limited to, teacher quality, school finance, and socioeconomic status and population density.

Conclusion

So, the data are aligned with the available literature: The relationship between school size and student performance is complex and sometimes contradictory. The characteristics of each type of school: Whether a well-attended small school that hosts intellectually engaged students who participate in a more focused curriculum or a resource-rich large school that provides a wide range of academic programs, many schools may be dependent on adequate levels of per-student funding to drive high levels of student achievement.

The findings in this study suggest that while personal relationships, small classroom instruction, and good communication may all be factors influencing higher academic levels, state funding might play a more significant role to the individual student as well as to entire school districts. However, analysis of the data from the ISAT shows there is no statistical significance to the relationship between school size and academic achievement.

After reviewing the literature and evaluating the data, the issue of academic achievement in large schools versus small schools is still very complex. Ultimately, I need to ask myself: which environment do I prefer my children to attend? A small one in which they receive learning through positive social surroundings, or a large one in which they receive learning in an atmosphere rich in educational resources.

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