

The Relationship Between School Facilities  
and Academic Achievement

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by

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## CHAPTER ONE

### INTRODUCTION

On North Broad Street in the city of Lancaster Ohio, in Fairfield County sits an elementary school that was built in 1917. Throughout the school day one might expect to hear the sound of children playing on the playground at recess while other students sit in classrooms to learn. However, the halls and playground of North Elementary are silent. Where are the children that used to go to this school, one might ask. They are being bused to other elementary schools in the city of Lancaster. In May 2005, the Lancaster City School Board voted that North Elementary would close at the end of the school year. The reason for closing North Elementary was that the school board decided the building was unsafe.

Of course the safety of the children comes first and the purpose of this research project is not to question the school board's decision or to suggest that children's safety is not important; however, this situation does raise the question, whether there is a relationship between school facilities and academic achievement.

Communities that have older school facilities love the old buildings and the memories that are attached to them of school days gone by. In the case of North School in Lancaster, this is one reason why the school building still stands. Community members formed a committee shortly after the school board voted close North Elementary in an attempt to save the building. North Elementary remains vacant today because the school district lacks the funds to either renovate or demolish the building.

Research has shown different opinions on this topic. When asked if there is a relationship between school facilities and academic achievement, Staff Sergeant Michael Wells

responded “of course there is, just look at school districts like Columbus versus Dublin.”

(personal communication, January 11, 2008) Being a recruiter for the US Army on the West side of Columbus, he gets to see firsthand the product of different school districts in the Columbus area.

On the other side of Columbus in neighboring Licking County, Newark City Schools asked the tax payers to approve a levy to support a school rebuilding plan in November 2004. Half of the district school buildings had been built before 1930 with the newest being 38 years old. At a school board meeting Lester Johnston stated that he did not feel “student academic achievement is tied to the age of a building.” A member of the community, Johnston felt this way because he was educated in a one-room schoolhouse (Sheehan, 2004, p. 1B).

This scene is played out over and over in the state of Ohio. There are communities, like Dublin, which are wealthy enough that their schools can afford to keep up their facilities, equip them with every modern convenience, and never have to worry about students attending school in dilapidated facilities. Some school districts are lucky enough to get state assistance and enough support from the community to replace antiquated facilities while other school districts struggle to work with facilities designed and built by previous generations for prior eras which are no longer adequate for today’s educational needs.

### The Problem

In 1990, the Ohio Department of Education surveyed the educational facilities in the state of Ohio. It found that

[Fifteen] percent of the schools in the state were 70 years old or older, 50

percent were 50 years or older, and 68 percent were 30 years or older. Seventy-

five percent of elementary schools were 30 years or older. Fifty percent of heating systems needed repair [. . .] Thirty percent of the roofs needed repair . . . satisfactory plumbing fixtures was found in only 25 percent of the buildings (Edlefson & Barrow, 2001).

While conducting interviews for this research project, a faculty member at Creekside commented that the band room in one of the old facilities was in the school basement in a room which at one time had housed the coal furnace. The repair estimate for Ohio school facilities in 1990 was \$10 billion, making Ohio one of the top states with the highest number of schools in the country in need of repair.

To tackle this issue, Ohio established the Ohio School Facility Commission. By the end of 2000 the (OSFC) had taken on 166 projects. Most of these were rural school districts with low property values, where the state's portion of the project averaged 80 percent (Edlefson & Barrow, 2001).

Although a school that met the third criterion of the research project was eventually located, the progress made by the OSFC did make it difficult to locate a school that had no current plans to replace the existing facility. Initially two schools were identified that met the criterion of having older facilities in a school district that did not have any plans to replace the existing facility. A site visit showed that looks can be deceiving. Once inside, it became obvious that these two schools did not meet the research criteria because the old part of the building had been extensively renovated and to preserve the historic appearance of the old building, additional classrooms had been added to the back of the building which could not be seen from the street.

### Delimitations

In this study, the following delimitations were used to investigate the relationship between school facilities and academic achievement.

1. The schools involved in the investigation of this topic were rural high schools in Appalachian Ohio in close proximity to one another.
2. The investigation focused on the opinion of the faculty members at the chosen schools.
3. Academic achievement of the students was measured by the composite score of the students taking the OGT.

### Limitations

Limitations of the findings and conclusions of this study and its relevance include:

1. Data collected was based on opinions of the faculty members at the chosen schools.
2. Inability to control for other outside variables that may impact student achievement and account for differences between chosen schools.

### The Procedure

Electronic resources available from Ohio University's Alden Library such as Educational Resources Information Center Search Engine (ERIC) and Education Research Complete showed that this topic is relatively unexplored. Searches brought up articles from as far back as 1922. While these early articles provided some interesting insight into the topic, these earlier articles are not included in this research project because our society has changed much in the 86 years since some of these articles were published. Other articles indicated that this topic is a matter

of interest in countries in Europe, Africa, and other parts of the world. So although one often wonders how American students compete on a global level, it is interesting to note that the quality of school facilities is a topic of concern across the globe.

The original research for this paper will focus of the relationship between school facilities and academic achievement in Appalachian Ohio. The schools chosen for this study are rural Appalachian high schools close geographic proximity and meet one of the following criteria: 1) Recently moved into a new facility 2) Currently building a new facility 3) No current plans to build a new facility.

Schools were chosen by convenience sampling and being known locally for meeting one of the above criteria. Selecting schools that were relatively close together served as an attempt to control for factors external to the region which may impact academic achievement. Limiting the chosen schools to a small geographical homogenous region allow for better comparison.

Interviews at three high schools, one in each category, involved three faculty members at each site. The selection of the participants was random in regards to being a faculty member at the chosen high school, individuals suggested by input of the chief administrator, and who was available to be interviewed. The interviews took approximately 10 to 15 minutes. Interview questions, in addition to asking about the schools facility, included questions about the participant, student body and the school. Most of the interview questions could have simply been answered with a yes or no response. This would make it easy to analyze the responses because responses could be quantified. However, the quality of the response was also important. To allow for this, participants were free to elaborate on their responses.

## CHAPTER TWO

### A REVIEW OF THE LITERATURE

Literature was retrieved from electronic resources available from Ohio University's Alden Library such as Educational Resources Information Center (ERIC) Search Engine and Education Research Complete using "school facilities" and "academic achievement" as search terms. Other search terms, including "learning environment", "school improvement," and "educational facility improvement" were also used but returned results on overcrowding in schools, teaching methods and teacher-learner relationships which were not relevant to this research topic.

#### The Condition of Our Schools

Before we can examine what impact school facilities have on academic achievement, it is important to understand the condition of our nation's schools. In 1995 the General Accounting Office (GAO) issued a report to Congress concerning the condition of our nation's schools. Its report showed that according to its criteria, one-third of our schools were in need of repair or replacement. The criteria that were used for this report were based on the legal description of "decent facilities" as defined in *Pauley v. Kelly*. This case defined "decent facilities" as

Those that are structurally safe; contain fire safety measures, sufficient exits, an adequate and safe water supply, an adequate sewage disposal system, sufficient and sanitary toilet facilities and plumbing fixtures, adequate storage, adequate

light; be in good repair; and be attractively painted as well as contain acoustics for noise control.

Using these criteria the GAO surveyed and evaluated 10,000 schools, and the resulting estimate for school repair was \$112 billion (Hodges, 1998, pp. 8-9).

Many of the repairs that were noted in the report included items needed to comply with federal mandates such as the Americans with Disabilities Act (ADA) and removing hazards such as asbestos, radon, and lead in plumbing systems or paint. Other items included were repairs or replacement of roofs, plumbing systems and improving energy efficiency.

A teacher in the state of Maine reported hazards in her classroom as a leaking ceiling, “bare wires, broken electrical sockets, cracked tiles, and exposed insulation.” (Black, 2007, p 39) Further inspection of the school indicated that teachers in other parts of the building were experiencing other hazards. A third grade classroom had to be vacated as a result of the teacher and students experiencing burning and watering eyes. In another part of the building the windows fit so loose that the temperature inside the classroom was affected by outside weather conditions causing students and the teacher to shiver while they occupied their classroom during the winter.

In Elizabeth Davis’ Junior High English class in Washington D.C. plaster fell from the ceiling fell during class. No students were injured in the incident; however, the plaster fell on student projects. Fortunately, this came just as the school was preparing to undergo a two-year renovation project which included asbestos removal. Work would be done in one part of the school while students continued to attend class in other parts of the building. Although she was pleased that the renovations were finally getting done; Ms. Davis felt that the plan to perform

the renovations around the students was “. . . not safe . . . not healthy, and . . . not practical” (Washington, 2005, p.B02).

To alleviate crowding in schools, many times classrooms are carved out of spaces that were never intended to be used as such. Some examples of these spaces include closets, stages, and coal bins. Jenifer Burns, a teacher at Stivers Middle School describes the prior use of the area that now houses her classroom as

the whole bottom floor of the school used to be an athletic complex. Sometime in the 1930s the area was divided into classrooms. Stairways that led to locker rooms are now stairways to nowhere. The swimming pool was simply built over. Jenifer’s classroom lies directly over the swimming pool which was “never filled in, just covered over.” (Woodyard, 1992, pp. 123-124)

The good news is that there is now a trend towards repairing and replacing school facilities. In 2006, \$1.65 billion in construction projects were started on schools in the states of Michigan, Ohio, and Indiana (Mitchell, 2006).

Ohio, just as many other states, has been focusing on facility improvements as a result of lawsuits. In 1990, the Ohio Coalition for Equity and Adequacy of School Funding (the Coalition) was founded with the mission of challenging the constitutionality of school funding in Ohio. Of the 612 school districts in the state of Ohio, over 500 are members of the Coalition. The Coalition’s governing body is the Steering Committee, consisting of representatives of 90 member school districts. Members of the Steering Committee consist mostly of school superintendents; however, treasurers, school board members, and even administrators serve.

The Coalition challenged the constitutionality of Ohio's school funding by filing the DeRolph case in December 1991 (<http://www.ohiocoalition.org/AboutUs.asp>. Retrieved July 23, 2008).

The DeRolph lawsuit came out of Perry County where a student, Nathan DeRolph, took an American History test on the floor because his school was short of chairs. Although this case was not directly concerned with the quality of school facilities, Morris Hawk indicates that the DeRolph case was about the "way Ohio educates its children" (1995, p. 683). As a result of the DeRolph case, the state took a close look at the condition of school facilities in Ohio.

The basis of the DeRolph case was Article I, section 7 of the Ohio constitution which states "it shall be the duty of the general assembly . . . to encourage schools and the means of instruction" and Article VI, section 2 "The General Assembly shall make such provisions, by taxation, or otherwise, as, with the income arising from the school trust fund, will secure a thorough and efficient system of common schools throughout the state" (<http://www.legislature.state.oh.us/constitution.cfm>, Retrieved July 30, 2008).

DeRolph was first heard in Perry County by Common Pleas Judge Linton D. Lewis, Jr. Lewis wrote that it is a violation of the Ohio constitution to fund public education with local property taxes. In addition, for not correcting the situation, the state legislature was negligent of its constitutional responsibilities (Doane, 2005, pp. 2-3). It is important, however, to note that when DeRolph II was decided in May 2000, Justice Pfeifer of the Ohio Supreme Court recognized the large amount of money that is raised by property taxes and the difficulty in replacing that income. Pfeifer stated "local property taxes raise such a mountain of money that it is not realistic to expect total replacement" (McKinley, 2005, p. 344).

The DeRolph case has been heard by the courts in the state of Ohio four times. Each time, the ruling was that the state funding system for public education is unconstitutional. In an action of “washing its hands” of the case, the Ohio Supreme Court has ruled in DeRolph IV that it no longer has jurisdiction over the case. As for its previous rulings on the case, the court is not making any effort towards enforcing its rulings or establishing a timeline for the state to make the school funding system comply with the constitution (<http://www.ohiocoalition.org/pdfs/Past-Present-Future.pdf>, Retrieved August 1, 2008).

Prior to DeRolph, the Ohio Department of Education found, among other issues, “fifty percent of heating systems . . . and thirty percent of roofs needed repair” in Ohio’s school buildings (as cited in Doane, 2005, p. 3). In an effort to make amends, ten years after the ruling on the DeRolph case, the state has contributed \$2.6 billion towards the repair, renovation and replacement of schools in the state. This is a drastic increase in state spending considering between the years 1957 and 1991 the state spend only \$175 million on school facilities (Doane, 2005, p. 3).

The current governor of Ohio, Ted Strickland, led his 2006 election campaign with the promise of fixing the school funding issue. He intends on keeping his promise and will unveil his plan early in 2009. Since taking office, his focus has been on education reforms and what he called an “overemphasis on standardized tests.” The governor’s new plan will tackle both funding and education reform. Strickland stated in an interview that “we need to both reform and adequately fund our schools,” by addressing only one issue and not the other, “we will have only perpetuated an existing system that is hugely flawed” (Niquette & Candisky, 2008, p. 01A).

## Causes of School Conditions

In some cases, the deterioration of school buildings is a result of natural causes, such as termite damage, as reported in one Louisiana school. However, not all deterioration can be blamed on natural causes. Older buildings require upkeep to stay maintained. As simple as this may seem, with budget crunches maintenance is one of those things that is often seen as something that can be easily deferred so money spent elsewhere. However

“maintenance can only be deferred for a given amount of time, because like the automobile whose oil is not changed, there will be a breakdown and the cost of repair will be many times that of the normal maintenance program” (Hodges, 1998, p.8).

In New York City, school officials discovered the high costs of postponing maintenance, “much of what needed repair in 1988 . . . [in 1997] now needs replacement.” This was a result of over a six year period cutting maintenance spending from \$0.97 to \$0.86 per square foot. The starting amount was considerably less than comparable maintenance plans in the private sector (Rein, 1997, pp. 10, 15).

Deferring maintenance is not an easy decision. It may not be the wisest choice to divert maintenance funds so money can be spent elsewhere in the budget; in fact, sometimes it can have disastrous results. In one instance, a school had taken on the expense of converting two classrooms into computer labs by upgrading the electric and running wire for networking. Shortly after the computers were put into place, the roof caved in (Hodges, 1998, p. 14).

How do our schools get it the situation where they have to make choices about where to spend their money? First, it has been argued that “[t]his is not a nation dedicated to creating

the best possible education system. There are lots of people who would rather have lower taxes than extend educational benefits” (Stake, 1999). In many cases, it is the state that “requires that local governments provide most of the funds for other categories of school expenditures such as: school sites, buildings, [and] . . . plant maintenance” (Jones, 2002, p. 38). There are large disparities in property values from one geographic region to another and as a result, the quality of education and school facilities varies from region to region.

In the case of rural schools, the school district is typically spread over a large area, but recent trends in agriculture have seen a consolidation of farms. This means that the burden of financing the public schools in those areas is placed on the shoulders of a smaller citizen base. The existing condition of our schools, combined with the advent of new technology for the classroom, increases in cost of heating fuels, market demands for the increase in teacher salaries have definitely placed our schools in a tight financial situation (Hodges, 1998, p. 3).

Disparities in funding can be readily observed in school districts throughout Ohio. Writing for *Case Western Reserve Law Review*, Morris Hawk indicated that “some districts [have] to ration toilet paper and . . . others . . . set up computer hook ups with Russia” (Hawk, 1995, p. 682).

In a way, it is almost advantageous to allow school buildings to deteriorate. The quality of education is intangible, so when the quality of education begins to suffer and school administrators need to show accountability, it is easy to use the condition of the facility as a scapegoat. “A photograph of a rotting ceiling or a filthy bathroom can create a stronger emotional reaction than a snapshot of ineffective classroom instruction, which can be difficult to capture” (Glenn, Picus, Marion, & Calvo, 2006, p. 13).

## Effects of School Conditions

According to Irene Nigaglioni, “students spend an average of 13,000 hours of their lifetime in a school building” (2005, p. 7). With so much time spent in the classroom, it is no wonder why some people believe that the condition of school facilities has an impact on student achievement. In fact a study showed that, when exposed to natural lighting, students “progressed 20 percent faster on math tests and 26 percent faster on reading tests in one year” in comparison to students who learned in classrooms lit by artificial lights (Bently, 2004, p. 10).

Lost time can be a significant factor in a school facility’s effect on student achievement. In two calendar years, the Commonwealth of Virginia recorded a total of 96 days lost because school districts made the decision to close on account of hot weather conditions and there were an additional 44 occasions of early dismissal due to the rise in temperature during the school day. Of course, these figures could be higher because they do not take into account days when schools remained open despite the fact that teachers and students were uncomfortable (Duke, Griesdorn, Gillespie & Tuttle, 1998, p. 3).

There may be those who attended school in the days before the advent of air conditioned schools who argue that air conditioning is not a necessity; however, studies show that “temperatures above 80F degrees tend to produce harmful physiological effects that decrease . . . work efficiency and output” (as cited in Jones, 2002, p. 31). A science project conducted by Ms. Fizzle’s class showed that classroom temperatures in the building fluctuated between the 60s and 98 degrees. She wondered “how can anyone expect excellence of teachers and students when we work under conditions like these?” (Creature Comforts, 2005, p. 43).

Other factors which result in lost days for schools include issues with electrical problems, water, sewer, and boiler failures. However, not all issues affect the entire student body. Sometimes a roof may leak in isolated areas and the school will remain open. The leaking roof may become distracting to students or the class may be moved to another area of the building. Other incidents of lost time affect individual students. These come in the form of student absences as a result of allergies caused by contaminants in the building, poor ventilation, and may even include severe injuries suffered from falling through a rotten floor (Duke, Griesdorn et al., 1998, p. 8).

In essence, the simple explanation is “the more time students are exposed to instruction, the more likely they are to learn.” (Duke, Griesdorn et al., 1998, p. 2) School buildings in poor condition can impact education by keeping students away from the classroom thereby decreasing the classroom time.

According to Deborah Moore (2002) the turnover rate of teachers is also influenced by the condition of school facilities. When this happens, valuable resources that could be used to better the educational experience of students are diverted towards recruitment and training new teachers (Moore, 2002, p. 8). A study shows that “teachers might be willing to take lower salaries in exchange for better working conditions” (as cited in *Facilities DO Impact Learning*, 2005, p. 27).

It is commonly believed that the physical condition of a learning environment can impact student achievement. However, due to the multiple factors which also influence education, there are few studies to support this common opinion. Wyoming is one of the few states that maintains a database containing information on the condition of all school buildings

in the state. For that reason, Glenn, Picus et al. (2006) selected Wyoming for a correlation study to determine where there is a correlation between school conditions and student achievement.

After completing the correlation study, which controlled for socio-economic status of students, to determine the correlation between the condition of school building and a three year average of student achievement based on results of proficiency tests and scale scores, the researchers determined that there was “[n]o significant correlation . . . between building Condition Scores and Proficiency Test Scores.” The authors concluded that money spent on improving school conditions “could have been better spent if the objective was to improve student achievement.” However, at the same time they also stressed the importance of having a safe environment in which students can learn (pp. 15-16).

A study of schools in England showed that although “teachers have had to work in second rate facilities for too long,” there is in fact a law of diminishing return when it comes to improving facilities. Inexpensive improvements such as improvements to lighting, paint schemes and new classroom furniture can improve student achievement while more costly improvements will not improve the student achievement enough to justify the expense (Paton, 2005, p. 18).

#### Other Factors Affecting Academic Achievement

Although students spend a lot of time in schools and their academic achievement can be affected by the condition of their schools, Robert Stake states (1999) that “schools are good for children, but schools cannot overcome deep deficits” (p. 668). In essence, it is important to recognize that students are a sum of their experiences and they are also heavily influenced by other factors which cannot be controlled by schools. Some of these factors include but are not

limited to the “economic status of students, parent literacy, and parent attitudes towards education” (Paredes, 1991, p. 1). Robert Stake (1999) further adds to this list to include “infant nurturing, sibling rivalry, early childhood experiences, peer inactivity, exposure to language and word games, [and] television” (p. 668).

With all these inputs, one may wonder how much of an effect school facilities have on academic achievement. A study conducted in Virginia revealed “cosmetic building conditions . . . [are] more significant in terms of behavior than structural building condition” (Abramson, 2001, p. 83). As discussed earlier, structural issues can cause student absences due to sustained injuries.

Jonathan Kozol has long been a leading voice on the issue of the conditions of school buildings. In 1991, he published his book *Savage Inequalities: Children in America’s Schools*, in which he painted a vivid picture of the abysmal conditions that prevailed in many urban school facilities. In an effort to address the condition of school facilities, *American School and University* magazine issued a series of reports titled “Facilities Impact on Learning.” The first installment was published in February 1992 and included an interview with Jonathan Kozol. In the interview he stated that

“ . . . when the roof is caving in, when the light fixtures are exposed, when the sewage leaks, when the rain comes in through the roof; . . . [t]his tells the children in the eyes of society, ‘You are nobody at all’” (as cited in Kennedy & Argon, 2004, p. 22-23).

A common trend at the time was for schools to organize motivational speeches featuring popular athletes or political leaders who share a common background with the

students. The speeches typically focused on the phrase “you are somebody.” One wonders what speaks louder, the speech or the condition of the schools. Jonathan Kozol states that the answer is obvious; the condition of the school speaks louder and the students know where they stand in the eyes of society (Kennedy & Argon, 2004, p. 23).

#### Environmental Costs

American society today has a tendency to think that new is better and we like to tear down old buildings in favor of replacing them with new ones. However, with recent fuel costs and new environmental concerns, it is important to consider the environmental costs of building new. A building has a large amount of energy invested in it. Energy is required to extract building materials, prepare the site, move materials to the site and run equipment to put the materials in place. It is estimated that a 50,000 square foot building requires an investment of 640,000 gallons of fuel (Lindlaw, 2008, p. 13).

Additional fuel must be expended if an existing building needs to be removed from the site. The act of tearing down an existing building creates a large amount of debris which must be removed from the site. It is often thought that a new “green” building can justify the negative environmental impact of removing an existing non-efficient building. This is not necessarily true, “[e]ven if 40 percent of materials in a new building are recycled, it takes about 65 years for a ‘green energy-efficient new office building to recover the energy lost in demolishing an existing building’” (Lindlaw, 2008, p. 13).

The condition of the school facility is going to be based on not only the buildings age but the quality of construction. “A 40-year-old building that was initially constructed to last 35 years will likely be in significantly worse condition than a similarly aged building designed to last 100

years.” (Picus, Marion, Calvo & Glenn, 2005, p. 17) The mean life expectancy of a school building is 50 years (Dejong, 2007, p. 38; Kube, Skinner, Edelstein, Schoff & Trump, 2006, p. 14). If the school buildings that are built today exceed the mean life expectancy by being well maintained they may last 65 years. By this time these buildings will finally recover the environmental costs. At some point in the future, it may be the case that there will be another movement to build new, thereby perpetuating this cycle of having a negative impact on the environment.

There are other ways to make renovating school buildings environmentally friendly. One such improvement is to evaluate the fenestration systems in the school. If windows are ill fitting or otherwise inefficient, they can be replaced with significant savings seen in heating and cooling costs. Another upgrade that could be considered is adding skylights. By increasing daylight in the classrooms less artificial light is needed. This of course will save on electricity usage and as an added bonus maintenance costs will go down because the less lights are being used; bulbs will not need to be replaced as often and other maintenance on lighting fixtures will decrease. Capistrano Unified School District in Orange County, California reports that when students were exposed to classrooms with large amounts of natural light, they performed “19 to 26 percent better than their peers in classrooms without these features” (Hale, 2002).

#### Feasibility of Renovating

There is just something to older school buildings. The architecture, large windows and the testament to education prior generations invested appeals to many people. In 2002 Columbus resident Barbara Hotchkiss was interviewed by *The Columbus Dispatch* concerning the school districts plan to close and tear down the nearby Indianola Alternative Elementary

School. "You cannot in good conscience raze a building that is as beautiful as Indianola," she said (Edwards, 8 February 2002, p. 01D). She felt that the architectural features of the 1904 structure should be part of the educational experience that cannot be replicated in a modern facility.

Does it make economic sense to renovate existing facilities in favor of building new?

Elmbrook School District, in Brookfield, Eaton County, Michigan asked the taxpayers to support a \$99.3 million building referendum. This plan included the renovation of the two existing high schools, expanding classroom square footage, replacing all mechanical systems and widening staircases to meet current fire code. The school superintendent said that the two high schools "would be virtually new schools inside and out, and would last for 50 to 60 years" (Sink, 2007).

This plan has been called a compromise. Estimates to replace the two schools came to \$125 million. The district has spent \$3.8 million to maintain the current two buildings during the past decade and if this renovation project is not carried out, it is projected that \$44 million will be needed to maintain and replace current mechanical systems. In this case, renovation of the current facilities comes at a significant savings over replacing the buildings (Sink, 2007).

### Conclusion

There is a wide range of opinions on whether school buildings have a discernable effect on student academic achievement. There does, however, seem to be a consensus that there are minimum standards which all schools must meet in order to be safe and comfortable for students and teachers.

## CHAPTER THREE

### METHODOLOGY

#### Research Design

Interviews were conducted in the chosen schools during the month of May 2008. Because the end of the school year was approaching, time was valuable and therefore the importance of brevity was recognized. The list of questions was kept short and the longest interview with the faculty included no more than 25 questions and most interviews lasted 5 to 10 minutes.

The first couple interview questions were designed to assist in building a profile of the participant by asking a few demographic questions. Other questions were focused on the school itself including questions concerning the student body and closing with questions that asked the participant's opinion on factors affecting student achievement. Not all questions were applicable in all situations. For example, when the school did not have any plans to build a new facility, the question "what do you feel the main purpose for the new facility is?" was not applicable. Other questions, mainly ones concerning the student body, were asked only of the guidance counselors.

Many of the questions asked during the interview could be answered simply with a yes or no. The interview was designed this way to make analysis of these responses easier. However, quantified information can only tell one so much. Therefore participants were encouraged to elaborate on their responses by justifying their opinion with offering up additional information and all participants took the liberty to do so.

The chosen schools were public high schools in Southeastern Ohio and the research called for one high school for each of the following criteria

1. No plans to renovate or replace the current facility
2. Currently in the process of building a new facility
3. Recently moved into a new facility.

Three faculty members from each of the chosen high schools were interviewed with the ideal participants being an administrator, guidance counselor and social studies teacher. Of the nine participants, all were Caucasian, eight were male and one was female. Their ages ranged from 38 to 61. The lengths of time participants had been in education ranged from 10 to 38 years with a mean of 22 years. This indicated that all have been in education long enough to have a good feel for what factors influence academic achievement.

The consent process included an explanation of the purpose of the study and a brief description of how the research data was going to be collected. Brian Agosta, from Creekside questioned why the research method called for interviewing three schools in different stages. He could not see how this method would produce results that would answer the research question. He likened this method to comparing apples to oranges and thought it would be better to examine three schools in the same stage. However, this method would involve schools in relatively the same condition. Without a baseline school, it would not be possible to compare the level of anticipation seen in schools concerning a new facility.

The only feasible way to conduct the research as Mr. Agosta proposed would be to follow the school through various stages, beginning with when it just started planning a new facility to gauge the anticipation that develops and finish up the study after the school has been

in the new facility for some time. The advantage to this method would be that the subject would be more homogenous as it would be the same school. However, since more time would be required to complete this study, there would be a greater chance of attrition.

Consent was obtained from the participants at the time of the interview. At that time, the participants were made aware of the objective of the research project, no risks were anticipated by participating in this study, and participation was voluntary. During the consent process, the participants were informed that in order to protect anonymity of the participants and the schools, they would be identified by randomly selected pseudonyms (See Table 1).

Table 1. Participants.

Interview participants			
Category	School	Position	Participant
No Construction	John Chapman High School	Math	Rusty Abele
		Science	Brad Nicodemus
		Social Studies	Alex Bush
New Construction	George Washington High School	Principal	Casey Bowers
		Social Studies Teacher	Josh Taber
		Guidance Counselor	Amber Greene
New Facility	Creekside High School	Principal	Chris Flowers
		Social Studies Teacher	Brian Agosta
		Guidance Counselor	Aaron McCafferty

## Participants

### No Construction: John Chapman High School

The school chosen for the control group of this research project is John Chapman High School. This school met the criteria for this study as the school district currently does not have any plans to replace its facilities.

It proved difficult to locate a school that met the requirements for this category that was willing to participate in this study. Two schools that were contacted did not respond to phone messages and written research proposals. Two additional schools were initially identified, but site visits revealed that the facilities had recently been renovated and an addition had been added to the backside of the building making the effective age of the school building newer than was desired for the purpose of this research project.

By the time John Chapman had been identified, the school year was winding down. Because of the unexpected death of a faculty member and the time of year, the principals and guidance counselors were unwilling to participate in the interview. In addition, one teacher also declined being interviewed.

In lieu of interviews with a guidance counselor and administrator, interviews at John Chapman were conducted with three teachers at John Chapman Central Campus, each of a different subject area to provide some diversity in interview participants.

John Chapman is a city school which also serves outlying areas in the county. The high school is divided into two campuses, Central and West. Central campus sits on the site of the old high school. A number of school buildings have stood on this site since 1906, with the two existing portions of the building built in 1930 and 1965. In the past the John Chapman school

district has had experience with unsafe facilities. In 1963 the State Fire Marshall declared the 1906 and 1917 sections of Central Campus as fire hazards and ordered them closed.

Central was closed at the end of the 2005-2006 school year. Unlike the case of North Elementary [see Chapter One, p. 1] Central was not closed for safety reasons, rather the campus was closed due to financial reasons and students were relocated to the West campus. However, portions of Central have been reopened to alleviate crowding at John Chapman West and starting in the 2008-2009 school year, a number of vocational programs will be moved from West campus to Central campus.

West campus is the newer and larger of the high school campuses and its building was opened in 1963. For the 2007-2008 school year, the student body of John Chapman consisted of 1,877 student in four grades.

Arrangements for the interview with Rusty Abele, a Math teacher at John Chapman Central were made by personal contact and an appointment was set for May 19, 2008. Rusty Abele was made aware of the purpose of this study in advance and was able to offer assistance in making arrangements for interviews with other teachers at John Chapman Central.

### *Rusty Abele*

Rusty Abele, age 45, was a Math teacher at John Chapman Central. He had been teaching for 23 years, all at John Chapman. The interview was held towards the end of the school day and students were in the classroom occupying the opposite corner from Mr. Abele's desk during the interview process. In the past, Rusty Abele had been the coach for the high school shot put and discus team. He was helpful in making arrangements for the interviews at John Chapman Central and was well liked by his students.

*Brad Nicodemus*

Following the interview with Rusty Abele, the next teacher that was available for an interview was the Science teacher Brad Nicodemus. Brad, age 50, had been teaching for 29 years with 21 of those in the John Chapman system. During the consent process, Brad expressed an interest in the research topic. The relationship Brad has with his students appears to be a positive one.

*Alex Bush*

The interview with the Social Studies teacher was conducted in the hallway as Alex Bush was returning from a trip to the Central Office. Alex Bush, age 40, spent 5 years in the US Army as an Infantryman. Afterwards, he attended Ohio University where he obtained his degree in Education. Alex had been teaching for a total of 12 years with the last 10 at John Chapman. A brief glimpse inside his classroom showed he had various posters decorating the walls, some social studies related, others with words of inspiration and a vintage US Army poster on the classroom door. During the interview, Alex seemed chatty yet at the same time straight forward. Because of his background, he was well respected by his students.

**New Construction: George Washington High School**

George Washington High School met the criteria for currently building a new facility. The new facility for George Washington High School is slated to open for the 2008-2009 school year. The purpose of this portion of the study was to determine if the prospect of a new facility led to anticipation of improved academic achievement and what factors faculty expected to contribute to the improved academic achievement.

George Washington served as the only high school in the county. The current facility was built in 1910 and was attached to the former elementary school which recently moved to a new facility. Enrollment at George Washington consisted of 1250 students.

A phone call to George Washington on May 1, 2008 yielded an appointment with the Principal, Casey Bowers, for Monday, May 5, 2008 to conduct the interviews. During the phone call, Bowers was made aware of the purpose of this study and the need for interviews with three faculty members. This information provided him some time to prepare by making arrangements with other faculty members who would be interviewed.

#### *Casey Bowers*

Casey Bowers, age 52, was the principal at George Washington. He had been in education for 30 years; all at George Washington. Of those 30 years, he had been a teacher for 22 years, 7 years as an Assistant Principal and at the time of the interview he was finishing up his first year as the principal of George Washington. The interview took place in his office and at times his humorous and caring personality shined through. He seemed very intelligent while his caring personality resulted in him being liked by the student body.

#### *Josh Taber*

The next interview participant was Josh Taber who at the time of the interview was on study hall duty in the cafeteria of George Washington. The cafeteria was the connector between the high school and elementary school. Josh Taber, age 43, had been teaching for 16 years as a social studies teacher at George Washington. A co-worker described Josh as “a great guy” who cares about his students. He was very lenient in regards to taking class assignments

late which to seniors can be the difference between graduating or not. Because of his personality and his late assignment policy, he was well liked by his students.

#### *Amber Greene*

Amber Greene, age 48, was the guidance counselor and she was available for interview. She has been in education for 24 years with the first 17 years as an elementary school teacher and the last 6 as a guidance counselor at George Washington. Her personality matched that of a typical of an elementary teacher as she seemed friendly and was cooperative during the interview. The students whom she served and the guidance office helpers seemed to enjoy working with her.

#### New Facility: Creekside High School

Creekside High School was chosen as the school that recently moved into a new building. The new facility opened for the 2003-2004 school year and consolidated two smaller county schools into one facility. Although this school did not move into the new facility as recently as intended for the purposes of the research project, it allowed for looking at this school from a new perspective. For many of the 540 students who are now attending school at Creekside, it is the only building they have ever known. In this respect, the newness of the facility has worn off.

In Doane (2005) a similar situation was discussed where a school recently moved into a new building and saw an increase in proficiency test scores. It was wondered at that time if the school could “improve or at least maintain these [test scores] in their new buildings?” (Doane, 2005, p. 7) This research project will seek to answer this question.

The campus of Creekside High School is located in a small farming community in rural Appalachian Ohio. The community's population was approximately 700 and the village covered less than one half of a square mile. Creekside is a consolidated school and its students come to Creekside from other surrounding farming communities in the county which once had their own school district.

Contact with another prospective school meeting the criteria of having a new facility had not yielded arrangements for interviews and contact with Creekside was made in person following the interviews at George Washington. Surprisingly, Creekside was able to accommodate the interviews at a moment's notice and therefore interviews were conducted on Monday, May 5, 2008, the same day as at George Washington High School.

#### *Chris Flowers*

The first interview conducted at Creekside was with the principal Chris Flowers. Chris Flowers, age 38, had been in education for 10 years, all at Creekside, the first 5 years as a teacher. The interview with Chris Flowers took place in a conference room where he had been working to prepare testing materials. He continued working during the interview process. This showed his dedication to his job and that he is a work-a-holic. He indicated that he was very concerned about his students' academic achievement. The entire office staff seemed to enjoy working with Chris Flowers and the encounter observed with the student office helper during the interview showed that he had a positive relationship with the students as well.

#### *Brian Agosta*

Following the interview with Chris Flowers, I was able to interview Brian Agosta in his own classroom during his lunch break. Agosta, age 43, was the Social Studies chair at Creekside

and had been a teacher for 18 years with the last 8 years at Creekside. He seemed very dedicated to education and was eager to volunteer to serve on committees or to be a coach. Because of his heavy involvement in all aspects of the educational process, he had a lot of contact with students and he was well liked by them.

### *Aaron McCafferty*

After a long wait following the interview with Brian Agosta, guidance counselor Aaron McCafferty was available for interview. Aaron was 61 years old and has been in education a total of 38 years. Thirteen of those years had been full time at Creekside in serving in roles as a guidance counselor and principal. He retired in 2001 and spent three years as a substitute teacher. Recently he returned to Creekside as a guidance counselor. Aaron McCafferty has a long history in education, having served in many different roles through the years. He was very knowledgeable in the field of education and clearly dedicated to his profession. He had a good relationship with the students that he served.

### Method

The questions asked during the interview were printed off in a questionnaire form (see Appendix A). These questions were asked verbally by the researcher to the participants during the interview. The responses of the participants were recorded on the questionnaire. If additional space was needed for the open-ended responses, additional paper was used. The questionnaires were kept on file to analyze the data and report the findings after which they were shredded.

Interview responses that were quantifiable were codified and entered into an Excel spreadsheet. Using the capabilities of Excel, analyses were run to compare the responses from

the control group (John Chapman) with those at George Washington to establish what level of anticipation, if any, existed with the prospect of a new facility being constructed; and also between George Washington and Creekside to determine if those anticipations were realized in terms of improved academic achievement when they moved into the new facility.

Not all responses from the interviews were able to be quantified. These responses were usually given by participants to justify the closed-ended responses they gave during the interview. The qualitative data will be used to categorize the responses given by the participants to determine patterns and justify outliers between the different groups of participants. When applicable, quotes from the interviews were used to support the analysis when reporting the quantified data.

## CHAPTER FOUR

### FINDINGS

#### The Sample

The interviews consisted of nine participants, three from each of the chosen schools. Ages of participants ranged from 38 to 61 with a mean age of 46 years ( $SD=7.04$ ). The number of years experience the participants had in education ranged from 10 to 38 years with a mean of 22 years ( $SD=9.15$ ).

All three of the chosen schools were in rural Appalachian Ohio and the student population ranged from 540 to 1877 with a median of 1250 ( $SD=668.93$ ). The student population at all three schools was predominately (98% or more) white which is typical for the Appalachian region. The graduation rate for the chosen schools ranged from 88.1% to 97.9% with the median of 94.9% ( $SD=4.35\%$ ). Two of the schools received an "Excellent" designation on their 2006-2007 School Year Report Card and the third school received an "Effective" designation for 2006-2007 School Year Report Card.

#### Physical Conditions

During the interviews, participants from both Creekside and George Washington shared what building conditions were like in the old facilities. These ranged from minor issues like a classroom was painted in "Pepto Bismol pink" to more severe ones such as leaking roofs and worn out mechanicals.

The principal at Creekside, Chris Flowers, indicated that the old building was 92 years old and that in many of the classrooms, windows did not close all the way. When asked what he

thought the main purpose for the new building was, he indicated that the old building was built for past generations and had deteriorated to the point that it was not cost effective to be refurbished. The music room was in the basement and at one point, his classroom was a modular which was “no place for a classroom” (personal communication, May 5, 2008).

Amber Green, the guidance counselor at George Washington also agreed that George Washington was built for past generations. The layout of the offices was not up to today’s standards. The guidance office was in another part of the building, distant from the main office. She also indicated that organization of classrooms did not always make sense. Logic indicated that room 238 would be on the second floor. In fact, it was a modular classroom that sat outside the school (personal communication, May 5, 2008).

The new facility at Creekside had a more organized layout compared to George Washington. The public entrance led directly to a reception area where visitors signed in and received an identification sticker. All of the offices were in one central location and were connected to this reception area. Aaron McCafferty also indicated that the middle school portion of Creekside was divided into “grade level wings” (personal communication, May 5, 2008).

The focus of this research project was the physical condition of the school and question 21 in the interview addressed this issue by asking all the participants if they thought “the learning environment can have an impact on student achievement” (see Appendix A). Eight of the participants said yes. Amber Greene argued that students’ achievement can be negatively affected if the student is cold or uncomfortable in the classroom (personal communication, May 5, 2008). However, Chris Flowers responded that an “effective teacher can overpower

anything” (personal communication, May 5, 2008). Aaron McCafferty felt that students were successful in the old facility, but he had seen an improvement as students had more school pride since the new facility opened (personal communication, May 5, 2008).

On a larger scale, interview participants were asked if they felt “the educational facility has an impact on education” (question 24, Appendix A). Seven participants said it did. Chris Flowers said that both the facility and the community have an equal effect on student by motivating them (personal communication, May 5, 2008).

### Overcrowding

The interview participants at George Washington and Creekside High Schools were asked the question, “was the old facility overcrowded” (number 14, Appendix A)? In the case of George Washington, the old facility referred to the current facility. Five of the participants provided answers that were quantifiable. Three said yes and two said no. Casey Bowers, the principal at George Washington High School also provided a response but he stated that the building was “at capacity” which did not fit into either category (personal communication, May 5, 2008).

Later in the interview, the participants were asked if they felt whether “overcrowding in schools can affect student achievement” (number 19, Appendix A). All nine of the participants responded and eight said yes. Amber Greene, the guidance counselor at George Washington High School responded it did not, indicating that “if a student is going to learn, they will learn regardless”. Saying so, she likened them to sponges (personal communication, May 5, 2008).

Along the same lines, it was important to establish whether overcrowding is a problem at the current school (number 18, Appendix A). Six of the nine interview participants provided a

straight yes (1) or no (5) response. The response at Creekside was unanimously 'no', and Aaron McCafferty pointed out that the current building was built larger than was needed and they in fact had extra classrooms. Chris Flowers stated that two additional computer labs had been set up in the building because they had so many extra rooms (personal communication, May 5, 2008). The one 'yes' response came from Rusty Abele who added that it was not an issue at Central Campus, but it was at West Campus. The primary reason why Central was reopened was to elevate overcrowding at West (personal communication, May 19, 2008).

Overcrowding is not tied directly to the condition of school facilities, but "overcrowding contributes to rapid decline of facilities due to overuse" (Jones, 2002, p. 33). This was evident at George Washington High School.

All interview participants agreed that the mechanicals were inadequate at the current facility of George Washington. During the interview with the principal, a message came into the main office to report that the paper towel dispenser in the women's restroom had jammed. Because of worn out plumbing, the women's restroom on the first floor was unusable and closed. The principal, Casey Bowers, indicated that jams and clogs are a common occurrence. With only one working women's restroom in the building, a real strain was placed on equipment in that restroom. Another indication of worn out mechanicals Amber Greene pointed out was that the public address system did not work in all parts of the building (personal communication, May 5, 2008).

It is important to note that George Washington was in the process of building a new facility and many of the maintenance repairs were just band-aids to get through the school

year. It was not economically feasible to make repairs to the leaking roof or overhaul the public address system when building was not going to be occupied next school year.

Although in some situations it makes economic sense to renovate an existing structure, it is not always practical. George Washington is an example of a situation where renovation was not an option. The campus was land-locked with no room for expansion. Casey Bowers indicated that the school was “at capacity” and if the student population grew, there would be no way to add on to the building (personal communication, May 5, 2008). In addition, when the building was built in 1910, space for parking cars was of little concern. In today’s society, the majority of high school students drive to school and one drove around the blocks surrounding the school it became obvious that George Washington did not have a student parking lot.

#### Factors Affecting Student Achievement

Many times access to technology is limited in older facilities because the infrastructure is inadequate to accommodate it. Therefore, question 20 in the interview (see Appendix A) asked, “do you feel access to technology can increase student achievement”? Seven of the participants responded affirmatively. Aaron McCafferty maintained that technology is a large part of students’ life today. The two remaining participants were not as quick to give a simple ‘yes’ or ‘no’ response to this question. Both felt that technology can increase student achievement provided it is used properly. Chris Flowers said that “you cannot just throw computers into a classroom” and expect to see a huge jump in a students’ academic achievement (personal communication, May 5, 2008).

As expected, when asked, “Do you feel the current facility is adequate?” (question 15, Appendix A), all interview participants at George Washington responded it was not. The social

studies teacher at George Washington, Josh Taber, felt that it is important that students have access to all parts of the building. He was making reference to the fact that part of the gymnasium has been walled off as a roof leak has made that area unsafe to occupy. He also said that one of the restrooms had “an outside wall exposed” (personal communication, May 5, 2008).

Brad Nicodemus at John Chapman West was the only other participant to reply that the facility was still adequate. He felt that technology was way behind as the only computer access was on the first floor and antiquated. However, he argued that this was minor as the building itself is adequate and it just needed to be retrofitted (personal communication, May 19, 2008).

Along these same lines, a question asked only of the faculty at John Chapman West was “. . .do you feel the current facility lacks anything that could contribute to better student achievement” (question 16, Appendix A). Rusty Abele was the only participant to say no, to which he added that this applied only to the Math department at West. The other two participants felt that technology was the biggest element that was missing that could impact student achievement. Brad Nicodemus felt that with access to a computer and a digital projector, he could do more presentations in his classroom (personal communication, May 19, 2008).

#### Effects of a New Building

With a new school building being built, the participants of George Washington High School were asked if they “anticipated any difference in students’ behavior” (question 22, Appendix A). Two of the three interviewees indicated they expected a difference, stating that in a newer and better facility students will take more pride in their school. In addition, the facility

will be larger than the existing one so there will be less crowding in high traffic areas such as the hallways and the cafeteria. Amber Greene, however, was less optimistic. She wanted to believe an improvement would occur. However she wondered whether someone can really “take the kid out of the country” using the phrase as an analogy to indicate that the facility may not a big enough variable to warrant a big change in a student’s behavior (personal communication, May 5, 2008).

A similar question was asked to the interview participants at Creekside. Since they had already moved into a new building, they would be able to determine if a change in student behavior had actually occurred. Aaron McCafferty indicated that discipline issues had decreased due to less crowding in the hallways and a better layout of the school. Chris Flowers’ opinion was divided. He has seen an improvement; however, it was only in those students who experienced both the old and new facilities. Otherwise, it was just a school to those students who had only attended school in the new building (personal communication, May 5, 2008).

A comparison was also examined concerning differences seen or anticipated in students’ academic achievement (question 23, Appendix A). At George Washington, one participant definitely expected to see a change in students’ academic achievement. Casey Bowers stated that George Washington had been rated as an “Excellent” school for two years and therefore he did not know how much improvement he could expect. However, Bowers expected to see an improvement in the atmosphere and the attitudes of the teachers as well as students.

Creekside did see an improvement in student academic achievement when it moved into the new building. Chris Flowers indicated test scores consistently improved since moving into the new building and the students were taking better care of the building. Aaron

McCafferty attributed this to better technology, enhanced curriculum, and better labs for science, industrial technology and vocational agriculture. The end result was that students could do more than before (personal communication, May 5, 2008).

In Chapter two, Paredes and Stake listed a number of outside factors that also contributed to academic achievement (see pp. 10-11). Question 25 in the interview (see Appendix A) asked the participants for their opinion on what factors contribute to academic achievement. While responses were varied, the two most frequently mentioned items were the socioeconomic status of the students and parental involvement. Alex Bush indicated that parental involvement was the biggest factor because when parents are not involved in their students' education it is difficult, if not impossible, to motivate the student (personal communication, May 19, 2008).

Question 15 asked the participants of George Washington and Creekside for their opinions on the main purpose of the new facility. Two participants indicated that the new facility was needed to alleviate overcrowding. Amber Greene indicated that there had been a recent influx in population in the area. With the current facility's location being landlocked, there was no room to expand (personal communication, May 5, 2008).

Other responses indicated that the old facility was too far out of shape to be refurbished. In some cases the layout was inefficient. At George Washington, the guidance office was in a different part of the building than the main office. Also at George Washington, Casey Bowers indicated that the mechanical systems were "shot" and handicap access was not a concern when the building was built in 1910 (personal communication, May 5, 2008).

Considering what the new facility offers in comparison to the old one, one of the biggest features was the size. Classrooms and offices are larger. For example, Aaron McCafferty indicated that his new office was 40 percent larger than his old office (personal communication, May 5, 2008).

Another feature is that the new buildings are fully climate controlled. This means students did not have to sit in cold classrooms during the winter which would distract them from the lesson. During the warmer months, the buildings can be air conditioned and students will not have to experience lost time due to classes being cancelled as a result of hot weather (personal communication, May 5, 2008).

During the interview, Casey Bowers indicated that he started teaching about the time John Chapman West was built and he had some friends who started teaching there when it opened. Bowers stated that John Chapman West was unique because it was built when no one was building schools. He was surprised to find out the building was not air conditioned. He felt that if it had been built a couple years later, it would most certainly would have been. To retrofit the building with air conditioning now would be financially unfeasible (personal communication, May 5, 2008).

### Summary

The prospect of a new facility for George Washington led faculty to anticipate improvement in student behavior and academic achievement. Amber Greene, however, seemed to be grounded in reality as she was somewhat hesitant to get her hopes up.

There are certainly issues which made the current building obsolete and which cannot be corrected with renovations or additions. The biggest factor was its location. When it was

built, it was built for a different generation. Nearly a century later more space is needed for students providing their own transportation and there was no room to add on to accommodate the current influx in students.

The faculty at Creekside indicated that their new facility had led to positive change in their students' behavior and academic achievement. With more space, discipline issues had decreased and academic achievement consistently increased. However, consistent with Amber Greene's hesitations, Chris Flowers indicated that the newness of the facility had begun to wear off and to students who had never known any other school building, Creekside is just another school.

Just because a building has an antiquated infrastructure does not always mean its needs to be replaced. In the case of John Chapman Central, the building lacked technology because the infrastructure to support it was not there. However, the building was structurally sound, and there appeared to be ample room at the school. Therefore the infrastructure could easily be updated and the facility made adequate.

## CHAPTER FIVE

### CONCLUSIONS

This research project involved an interview with three faculty members at each of three high schools in rural Appalachian Ohio. In order to be considered for participation in this study, the chosen schools had to meet one of following criteria: recently having moved into a new facility, currently building a new facility, or having no current plans for new construction. Respectively, the schools that were chosen for participation in each of these categories were Creekside, George Washington, and John Chapman.

The majority of interview participants felt that the building does have an effect on student achievement. However, at each school one out of three faculty members indicated that it did not. This reflects the fact that not all people believe that a building facility has a significant impact on student learning. This is consistent with the findings by Glenn, Picus et al. (2006) which Wyoming found no relationship between the condition of school facilities and students' performance. Because so many factors can influence academic achievement, it is difficult to pinpoint the exact impact a building can have.

It appears there is no "cookie cutter" plan that can be devised and applied. Every context needs to be carefully evaluated by considering the specific goals the district has in mind and conducting various cost benefit analyses to establish what is best. Sink (2007) showed that in some instances total renovation of existing facilities is feasible and comes at a significant savings to replacing the old structure. There were schools that were initially identified for this research project that illustrated this point, provided there was room on the campus to build the

addition. By building these additions on the back side of the existing facility, the new building could be hidden, thereby maintaining the school's historical appearance. Preserving school buildings in this manner may well satisfy people, such as Barbara Hotchkiss [see Chapter 2, pg 18], who believe that learning in an historic school facility provides students with a unique educational experience that cannot be replicated in any modern facility.

There are times when other facility improvement goals need to be met that cannot be resolved by renovating the existing facility. This was the case at Creekside where it made more sense to build a new facility so the district could consolidate a number of different schools on one central campus. .

Similarly, George Washington school district made the decision to move the high school to a new campus because its current facility was landlocked with no room to expand. Not only was the old building starting to reach capacity, the campus did not offer any space to add on to the existing facility nor did it provide any land to build a parking lot for students. So even though the facility could be renovated at a significant savings over building new, expansion issues could not be resolved.

Brad Nicodemus, a science teacher at John Chapman, argued that the school's main campus was adequate with the exception that computer access was limited to the first floor. With recent advances in technology, this deficiency could be solved by using mobile computer labs and creating wireless networks. This is also a viable option for school districts who intend to install networks in historical buildings as it will not detract from the aesthetics of the building (Breeding, 2007, p. 17).

### Evaluation of the Research

This research project called for conducting interviews at three separate schools, each in a different phase in terms of its facility. While Brian Agosta, one of the interviewees at the recently opened new facility at Creekside, suggested that it would have been better to study three schools all in the same phase, the research design for this study allowed the researcher to establish a baseline using the information provided by the faculty at John Chapman West, where there were no renovation or new building plans. Comparing this baseline information to the perspectives offered by faculty at two other schools suggests that the condition of the school facility does have an impact on student achievement, however only as an indirect result. As indicated by Brad Nicodemus (see p. 36), the facility on John Chapman's main campus was adequate. Its only deficiency was its lack of technology teaching aids.

The faculty at George Washington expressed high hopes the new facility would have a positive impact academic achievement. Faculty perspectives at Creekside, however, indicate that these effects may be short-lived as it is only a matter of time before the "newness" of the facility wears off. The lasting improvements faculty of Creekside noted, however, were improved student attitudes and less discipline issues. Yet, these changes in student behavior may well have a positive impact on student academic achievement. Fewer discipline issues means students spend more time in the classroom and less in the principal's office while at the same time the teachers spend more time teaching than dealing with classroom disruptions.

Due to time constraints, the option to study a group of schools in the planning stages of a new facility and following them through the entire process, including a specific period of time while in the new facility, was not possible. Although such a design would have allowed for more

control for variations in external factors, it was not feasible. Research using this approach, however, most likely would reinforce the finding that there is no cookie cutter solution to this problem and that the decision about how to decide what is the best course of action to meet the school districts needs depends on context.

The three categories used in this research study included a school that did not have any current plans to build a new facility, currently was building a new facility, and had recently moved into a new facility. George Washington, which was in the process of building a new facility was the first choice of the researcher. Creekside participated as the “recently moved in” school had been in the new facility more than two years. However, this circumstance turned out to be beneficial as the interviewees had been witness to how their students reacted to the new facility when it first opened and as well as how its “newness” wore off and the building became just another school to the students.

Finding a school district that did not have any plans to build a new facility and was willing participate was a challenge. One school never returned phone calls, and an administrator at another requested a written research proposal and then never acted on it. It appeared as if these schools did not want to participate because they were embarrassed to be associated with a school district with no plans to replace the existing structure.

Even John Chapman did not meet the ideal standard as neither an administrator nor guidance counselor was available to be interviewed. John Chapman’s facilities, with a few minor deficiencies were adequate. Casey Bowers, the principal at George Washington, which was in the process of building a new facility, had friends who worked at John Chapman West Campus when it opened in 1963. While discussing what the new George Washington facility

would offer, he referred John Chapman West in terms of what its current facility had to offer when it was built and what, in his opinion, was omitted. He indicated that during the planning stages of the new the George Washington facility the school district looked at previous building projects of nearby school districts. This provided them with an opportunity to learn from the mistakes of other districts and to see what worked as well as what did not.

#### Recommendations

To make a recommendation to school districts who are in the process of deciding whether to replace or renovate an existing facility, it may be best to do so both in terms of cost effectiveness and impact on the environment. However, as suggested in the case of George Washington and Creekside, there are instances in which obsolescence simply cannot be resolved by renovation. For example, when the school has outgrown its campus, as was the case in George Washington, there was no choice but to build a new facility. Likewise, the Creekside school district found it more convenient to build one larger new facility in order to consolidate its schools on the new Creekside campus rather than to continue maintaining a number of smaller dilapidated schools.

Once a school district has completed its facility improvement process, it needs to protect its investments. One way to prevent the premature aging of school buildings is to perform maintenance when it is needed. Deferring maintenance increases the cost of maintenance because oftentimes items need to be replaced rather than repaired. By maintaining the integrity of a school building, a school district can prevent costly replacement expenses.

Education resembles a recipe: the quality of the end product is a direct result of the quality of the ingredients. There are many factors in education that cannot be controlled, such as socioeconomic background, parental involvement. However, we can control the physical condition of the learning environment. With at least one quality ingredient in the mix, school districts should be able to accomplish better end results. Educators owe it to their students to give them the best education possible. Since school facilities are part of that mix, society should also provide them with the best possible environment in which to learn.

Paton (2005, p. 18) raised the question of what it is that constitutes an effective school. With the law of diminishing returns, we need to be able to establish what such a school is like so financial resources are not wasted. Therefore it is necessary to “keep it simple” so that extra savings can be spent in other areas of the educational process. Perhaps the best rule of thumb when considering whether to renovate or construct new is to define “decent facilities” as was determined in *Pauley v. Kelly* [see Chapter 2, p. 6].

When a school district is in the process of considering facility improvement, it should consider the feasibility renovating the existing facility. In many cases renovation of the existing facility can come at a significant savings over building new. Also, considering the amount of energy resources that is needed to construct a building, renovation may be a better choice from an environmental perspective.

Regardless of whether a school building is renovated or replaced with a new facility, it is important that it meets the qualifications of a decent facility. The primary consideration in this case should be its safety. This of course includes meeting all fire codes, being structurally sound and free from toxic hazards such as asbestos or radon. In addition, the school needs to be

accessible to all students it serves. Considerations need to be made to meet the requirements of the American with Disabilities Act, including width of door openings, adequate restroom fixtures and accessibility to school entrances.

Technology is such a large part of students' lives today that school districts need to insure that its school facilities provide adequate access to these technologies. By sending a message of care to students by providing high quality school facilities, school districts will enable the students by building on what they already know and preparing them for a lifelong relationship with technology.

Lastly, school facilities need to be flexible. They represent a large investment in the next generation and it is difficult to predict how its future needs may change. We need to be sure that our facilities can adapt to changing trends in education so buildings do not become outdated and need to be replaced before they reach their life expectancy.

## Appendix A

1) Name of School: \_\_\_\_\_

2) What is the condition of your school facility?

New within past 2 years

Currently in process of building new facility

No current plans for building a new facility


3) Name of Participant: \_\_\_\_\_

4) Age of Participant: \_\_\_\_\_

5) How many years have you been in education? \_\_\_\_\_

6) How many years have you been at this school? \_\_\_\_\_

7) Participant is a

Administrator

Guidance Counselor

Teacher


8) How many students are at this school? \_\_\_\_\_

9) Median income of community \_\_\_\_\_

10) Racial make-up of the school \_\_\_\_\_

11) Graduation Rate \_\_\_\_\_ 11a) Percentage attending college \_\_\_\_\_

12) How would you rate the academic achievement of your school? \_\_\_\_\_

12a) Instrument used? \_\_\_\_\_

13) What does the new facility offer that the old facility lacked?

\_\_\_\_\_

14) Was the old facility overcrowded?

Yes

No


15) Do you feel the current facility is adequate?

Yes

No


16) What do you feel the main purpose for the new facility is? \_\_\_\_\_

17) If your school district currently does not have plans to replace an existing facility, do you feel the current facility lacks anything that could contribute to better student achievement?

Yes

No

17a) If yes, what does the current facility lack? \_\_\_\_\_

18) Is overcrowding a problem at your school?

Yes

No

19) Do you feel overcrowding in schools can affect student achievement?

Yes

No

20) Do you feel access to technology can increase student achievement?

Yes

No

21) Do you feel the learning environment can have an impact on student achievement?

Yes

No

22) Have you seen or anticipate any difference in students' behavior in the new facility

Yes

No

23) Have you seen or anticipate any difference in students' academic achievement

Yes

No

24) Do you feel the educational facility has an impact on education?

Yes

No

25) What other factors do you feel contribute to academic achievement? \_\_\_\_\_

\_\_\_\_\_

Email address for follow-up questions: \_\_\_\_\_

Describe Personality: \_\_\_\_\_

How is participant liked by students? \_\_\_\_\_

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