

A STUDY OF TEACHER EXPERIENCES DURING A RENOVATION  
PROJECT

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## **Abstract**

The purpose of this study was to investigate and report teacher perceptions during a renovation project. A quantitative analysis of six demographic variables and a 24 item survey questionnaire provided information related to school renovation, school leadership, student academic achievement, and teacher morale. This phenomenological study included survey responses from 74 out of a possible 76 teachers who were present during one of the two almost identical high school renovation projects in a rural school division in Virginia. These two high schools had the same renovation timeline, floor plan, architectural design team, and construction company. Independent sample t-tests and one-way Analysis of Variances (ANOVA) were used to determine differences in teacher satisfaction, schools, or demographic variables. The first major finding found overall teacher satisfaction was minimally affected by the renovation project (satisfied 36.5%, neutral 59.5%, and dissatisfied 4%). Factors that may have affected this finding include: lapse in teacher memory due to collection of data 10 months after the completion of the project, a feeling of ambivalence by the teachers, or the fact that the principal of one of the schools was also the researcher which may have caused survey responses to be more neutral. Both males and females felt satisfied but the females were less satisfied regarding safety, cleanliness, job satisfaction, and school rating. Differences between satisfied and dissatisfied teachers involving cleanliness, considering relocating during the project, seeking a transfer to avoid another project, and room temperature were found to have significance and moderate effect sizes. The schools had differences in overall satisfaction levels with one school having more satisfied teachers

versus more teachers coded as neutral at the other school. While teachers at both schools felt safe during the renovation project and odor had an effect on satisfaction, satisfaction levels were different at each school. The last finding was a difference in job satisfaction levels between the age categories of 21-25 and 26-35 which could affect teacher retention. This study also concludes the need for doctoral and principal preparation programs to include information regarding the leadership role during a renovation project and how decisions may affect teacher satisfaction.

## **Dedication**

I want to dedicate this work to my beloved wife, Renee. You have given me a tremendous amount of support and encouragement from the first class to the last page of this document. Without your help I could not have achieved this accomplishment. Gratitude also goes to my mother who has always told me that I can succeed at anything that I set my sights upon. And a special thank you goes to my three cats: Bixby, Satchel, and Wiley. Their continuous determination to lay on my lap, keyboard, and research paperwork allowed the typing to be a little less painful.

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## Table of Contents

	Page
Abstract .....	ii
Dedication .....	iv
Acknowledgements .....	v
Table of Contents .....	vi
List of Tables .....	x
List of Figures .....	xiii
Chapter 1 .....	1
Introduction of Study.....	1
Setting the Context for Inquiry.....	3
Statement of the Problem .....	4
Significance of the Study .....	4
Research Questions .....	5
Limitations of the Study .....	5
Theoretical Framework .....	6
Organization of the Study .....	8
Chapter 2 .....	9
Structure of Literature Review .....	9
Present Level of Building Conditions .....	9
Relationship of Building Conditions and Learning Environment .....	11
Relationship of Building Conditions and Student Achievement .....	13
Relationship of Building Conditions and Leadership .....	17

Teacher Satisfaction during Renovation Projects .....	26
Interpretations of Literature Review .....	28
Summary .....	29
Chapter 3 .....	30
Introduction of Methodology.....	30
Design .....	30
Setting .....	31
Population .....	32
Instrumentation .....	32
Procedures .....	34
Data Analysis .....	36
Delimitations / Limitations.....	38
Summary .....	39
Chapter 4 .....	40
Introduction of Findings .....	40
Demographics for Survey Respondents .....	40
School and Gender .....	40
School and Age .....	40
School and Number of Classroom Moves .....	41
School and Subject Area Taught by Teacher .....	42
School and Years of Teaching Experience .....	42
Survey Scores and Codes .....	43
Responses to each Survey Question .....	43

Data Analysis .....	49
Research Question 1 .....	49
Research Question 2 .....	49
Research Question 3 .....	72
Research Question 4 .....	79
Gender and Survey Questions .....	79
Age Category and Survey Questions .....	82
Number of Classroom Moves and Survey Questions .....	84
Subject Area Taught and Survey Questions .....	84
Years of Teaching Experience and Survey Questions .....	85
Responses to Open Ended Questions .....	86
Chapter 5 .....	89
Introduction .....	89
Summary of Major Findings.....	89
Finding #1 .....	89
Finding #2 .....	90
Finding #3 .....	91
Finding #4 .....	92
Finding #5 .....	92
Finding #6 .....	92
Finding #7 .....	93
Finding #8 .....	93

Conclusions .....	94
Implications for Practitioners .....	96
Recommendations for Further Research .....	96
References.....	98
Appendices	
Appendix A. Survey Instrument .....	111
Appendix B. IRB Certificate of Completion .....	113
Appendix C. IRB Exempt Approval .....	114
Appendix D. Permission Letter to Dr. Gary McQuain .....	115
Appendix E. Permission Letter to Principal .....	116
Appendix F. Information Letter to Teacher .....	117
Appendix G. Survey Demographic Data .....	121
Appendix H. Questionnaire Responses .....	123
Appendix I. Satisfaction Scores and Codes for each Survey .....	126
Appendix J. Permission Letter to use Theoretical Model .....	128

### List of Tables

Table	Page
1. Physical Characteristics of a School that Directly or Indirectly Affect Learning .....	13
2. Time Spent on Renovations Devoted to Specific Activities .....	18
3. Questions to Consider When Negotiating Responsibility .....	23
4. Questionnaire Demographics by School and Gender .....	40
5. Questionnaire Demographics by School and Age .....	41
6. Questionnaire Demographics by School and Number of Moves .....	41
7. Questionnaire Demographics by School and Subject Area Taught .....	42
8. Questionnaire Demographics by School and Years of Teaching Exp.....	42
9. Means for Questionnaire Responses .....	48
10. Intercorrelations Among Overall Satisfaction Code and Survey Question	49
11. Summary of 1x3 ANOVA for Satisfaction Code vs. Survey Question 2...	51
12. Bonferroni Comparison for Satisfaction Code and Question 2.....	51
13. Summary of 1x3 ANOVA for Satisfaction Code vs. Survey Question 3...	52
14. Bonferroni Comparison for Satisfaction Code and Question 3.....	52
15. Summary of 1x3 ANOVA for Satisfaction Code vs. Survey Question 4...	53
16. Bonferroni Comparison for Satisfaction Code and Question 4.....	53
17. Summary of 1x3 ANOVA for Satisfaction Code vs. Survey Question 6...	54
18. Bonferroni Comparison for Satisfaction Code and Question 6.....	54
19. Summary of 1x3 ANOVA for Satisfaction Code vs. Survey Question 7...	55
20. Bonferroni Comparison for Satisfaction Code and Question 7.....	55
21. Summary of 1x3 ANOVA for Satisfaction Code vs. Survey Question 8...	56

22.	Bonferroni Comparison for Satisfaction Code and Question 8.....	56
23.	Summary of 1x3 ANOVA for Satisfaction Code vs. Survey Question 9...	57
24.	Bonferroni Comparison for Satisfaction Code and Question 9.....	57
25.	Summary of 1x3 ANOVA for Satisfaction Code vs. Survey Question 10...	58
26.	Bonferroni Comparison for Satisfaction Code and Question 10.....	58
27.	Summary of 1x3 ANOVA for Satisfaction Code vs. Survey Question 11...	59
28.	Bonferroni Comparison for Satisfaction Code and Question 11.....	59
29.	Summary of 1x3 ANOVA for Satisfaction Code vs. Survey Question 12...	60
30.	Bonferroni Comparison for Satisfaction Code and Question 12.....	60
31.	Summary of 1x3 ANOVA for Satisfaction Code vs. Survey Question 13...	61
32.	Bonferroni Comparison for Satisfaction Code and Question 13.....	61
33.	Summary of 1x3 ANOVA for Satisfaction Code vs. Survey Question 14...	62
34.	Bonferroni Comparison for Satisfaction Code and Question 14.....	62
35.	Summary of 1x3 ANOVA for Satisfaction Code vs. Survey Question 15...	63
36.	Bonferroni Comparison for Satisfaction Code and Question 15.....	63
37.	Summary of 1x3 ANOVA for Satisfaction Code vs. Survey Question 16...	64
38.	Bonferroni Comparison for Satisfaction Code and Question 16.....	65
39.	Summary of 1x3 ANOVA for Satisfaction Code vs. Survey Question 17...	66
40.	Bonferroni Comparison for Satisfaction Code and Question 17.....	66
41.	Summary of 1x3 ANOVA for Satisfaction Code vs. Survey Question 18...	67
42.	Bonferroni Comparison for Satisfaction Code and Question 18.....	67
43.	Summary of 1x3 ANOVA for Satisfaction Code vs. Survey Question 19...	68
44.	Bonferroni Comparison for Satisfaction Code and Question 19.....	68

45.	Summary of 1x3 ANOVA for Satisfaction Code vs. Survey Question 20...	69
46.	Bonferroni Comparison for Satisfaction Code and Question 20.....	69
47.	Summary of 1x3 ANOVA for Satisfaction Code vs. Survey Question 21...	70
48.	Bonferroni Comparison for Satisfaction Code and Question 21.....	70
49.	Summary of 1x3 ANOVA for Satisfaction Code vs. Survey Question 22...	71
50.	Bonferroni Comparison for Satisfaction Code and Question 22.....	71
51.	Summary of Satisfaction Code and School .....	72
52.	Crosstabulations of Satisfaction Code and School and Gender .....	73
53.	Crosstabulations of Satisfaction Code and School and Age .....	74
54.	Crosstabulations of Satisfaction Code and School and Number of Moves ..	75
55.	Crosstabulations of Satisfaction Code and School and Subject Taught.....	76
56.	Crosstabulations of Satisfaction Code and School and Years of Experience	77
57.	Group Differences between School and Survey Question .....	78
58.	Group Differences between Gender and Survey Question .....	79
59.	Summary of 1x5 ANOVA for Age Category and Survey Question 14.....	82
60.	Bonferroni Comparison for Age Category and Survey Question 14 .....	83
61.	Significance Levels for Classroom Moves and Survey Question .....	84
62.	Significance Levels for Subject Area Taught and each Survey Question ...	85
63.	Significance Levels for Years of Teaching Experience and each Survey Question .....	85
64.	Frequency of Open Ended Responses .....	87

**List of Figures**

Figure		Page
1.	Theoretical model design on the relationship of school building condition and student achievement and behavior .....	7
2.	The effect of building conditions and leadership on teacher attitude which affects student achievement .....	7

## A Study of Teacher Experiences during a Renovation Project

### Chapter 1

#### Introduction of Study

Wilson Memorial High School in Fishersville, Virginia, underwent renovations to its building at a cost of 21 million dollars (P. Coffield to G. McQuain, personal communication, April 13, 2006). As the architectural design and timeline for the planning phases started in the spring of 2005, many people, including the faculty and student population, were glad to see the project finally come to fruition. The building was built in 1972 and it was time for the needed expansion and repairs to occur. During the planning process, input was gathered from the administration, teaching faculty, secretarial staff, and community. All of their ideas were integral parts of the decision making process. The principal during the time of the renovation project was instrumental in determining the planning phases with respect to the protection of the learning environment for the teachers and students. As the actual starting date for the construction approached, a major change occurred: a new principal was hired. The existing principal was moved to a larger high school within the county and an assistant principal within the county was promoted to fill the vacancy at Wilson Memorial High School.

During the first two weeks of the new principal's tenure, a major decision was discussed regarding the previously approved timeline. The architect and construction company wanted to start the renovation process on eight additional classrooms, originally scheduled for phase two, to renovate in phase one of the project. The new principal and assistant superintendent had to consider the ramifications of allowing this change to occur. The list included: storage for all of the science material, classroom space for the eight relocated teachers, new configuration of locker space for the students, new configuration for hallway transit for the students, loss of air

conditioning for half of the academic wing, and the loss of technology space for two business labs. For the construction company, it was a simple request that would allow for a smoother start to the project ultimately allowing for an earlier completion.

For the principal, space for eight teachers and their supplies was the main priority and a solution would need to be found in order to keep the educational day intact. Within twenty-four hours the decision was made to approve the timeline change. A list of needs had been created by the principal in order to allow this change to work for both parties. Two classrooms would be created inside the existing library, construction workers and teachers would move all of the supplies from the eight classrooms to other designated locations within four days, and three of the eight teachers would now have to float from one room to another. All of this was completed within a four day window even though the teachers had already left for their summer break. This was an experience that was heavily discussed by the teachers throughout the renovation project as having both a positive and a negative impact on their teaching effectiveness and morale.

This situation was just one of the many situations that occurred during the renovation project. A principal must be able to make informed decisions that will keep the learning environment intact while also being able to maneuver teachers' classrooms, supplies, and schedules without disrupting the normalcy of a school building (Earthman, 1994). These decisions may have a positive or negative effect on the teachers that could directly alter the teachers' attitudes.

The renovation project at Wilson Memorial High School and Stuarts Draft High School were studied and documented allowing the history of the event to contribute to the collected knowledge regarding teacher experiences, teacher satisfaction, and the relationship of building conditions and student achievement. These two high schools had the same renovation timeline,

floor plan, architectural design team, and construction company for their renovation projects. Both are located in the same county, school division, and their student populations are within 20 students as well as both principals having less than two years of experience as a principal. These common characteristics among the two high schools produced a unique situation for this study by providing two separate but similar settings in which data were collected, analyzed, and compared to find commonalities and differences.

### **Setting the Context for the Inquiry**

Teachers experience a multitude of situations during a renovation project even though plans and procedures attempt to limit as many conflicts as possible (Brenner, 2000). Brenner also stated conflicts such as communication with the construction company, custodial involvement, safeguarding students, noise distractions, bugs, and poor air quality occur during the renovation project. Others also appeared once the punch list had been completed by the contractor that could cause conflict with the students' learning environment. The quality or condition of a school facility has a direct relationship towards student achievement which is a direct reflection on each individual teacher (Earthman, 1998a; Young, 2003). The study by Young (2003) further stated a controlled and structured environment was crucial in providing an educational learning environment for students and teachers. "It is simply a fact that the school environment itself has a largely untapped potential as an active contributor to the learning process" (p. 5).

Moore and Warner believed "if students can succeed in spite of the facility, what level of success can be reached if we remove the roadblocks?" (Moore & Warner, 1998, p. 1). Renovations to a school building were and always will be in direct conflict with maintaining a school setting that would allow teacher success as well as student success (Uline, 2000). This

study will add to the body of knowledge concerning teacher satisfaction while searching to identify common factors of the teachers' experiences that were prevalent during a renovation project. Recommendations by the teachers will also be included. This information will lead to recommendations for an administrator in the decision making process during future renovation projects.

### **Statement of the Problem**

Research has been conducted that suggests a positive relationship between building conditions and student achievement. Research of school leadership and the condition of a building has also found a positive relationship. Research is available on teacher satisfaction as it relates to student achievement but it does not identify the specific factors associated with those teachers. Also, the research only includes minimal recommendations from the teachers involved in a renovation project. The renovation of a school building will continue to occur while the school day remains in session. Therefore, difficult experiences may occur that will affect the learning environment during this time and the more knowledge that is gathered will allow for a decrease in the number of difficult experiences as well as providing solutions for the problems.

### **Significance of the Study**

This case study documented and examined the teacher perceptions during a renovation project at two high schools. The purpose of this study was to identify the difficulties and successes that confronted teachers during a renovation project and identify the common factors of the teachers who had the majority of the experiences. This research addressed the variables of gender, years of teaching experience, age, number of times a teacher's room assignment was relocated, school building in which the teacher taught, and teaching subject. The teachers self

reported the data and included recommendations that the teachers deemed to be important concerning their satisfaction during a renovation project.

### **Research Questions**

1. What were the common perceptions reported by the teachers who had satisfying experiences during a renovation project?
2. What were the common perceptions reported by the teachers who had dissatisfying experiences during a renovation project?
3. Were there any differences in teacher perceptions between the two schools? If so, what were the differences?
4. Were there any relationships between teacher perceptions and the specific demographics? If so, what were they?

The product created by this study could be used by national, state, and local school leaders. The collected data could be used for proactive decision making as the planning process of a renovation project is started. Rural and urban schools may use this information as the perceptions of teachers provide insight into the expectations of the project. As the research is expanded on the relationship of building conditions and student achievement, the survey could be used or adapted in other research to add to the findings.

### **Limitations of the Study**

Limitations of this study included the data collection from only two rural high schools. The schools, Wilson Memorial High School and Stuarts Draft High School, are located in Augusta County, Virginia, which provided internal findings that may not be able to be used for comparison. The timeframe for the collection of the data occurred nine months after the project had been completed. The amount of lapsed time may have affected the memory of the

participants. Only a quantitative study will be used although a qualitative study could have been completed on some of the collected data. The author of this dissertation is also the principal of Wilson Memorial High School. Therefore, as a researcher, I acknowledge that I have a perspective already created from my own experiences. I made every effort to set aside my perspectives and biases while critically reflecting on the research data.

### **Theoretical Framework**

The relationship between school building condition and student achievement and behavior was studied by Cash (1993). Her theoretical model is presented in Figure 1. Students' achievement test scores were found to be lower in buildings with ratings of poor school building conditions than scores in buildings with higher ratings of school building conditions. The difference in the scores for the varied conditions was found to be up to five percentile points. The student achievement gap appeared to be more related to the cosmetic factors than to structural factors.

This study used the Cash (1993) model on the relationship of building conditions and student achievement and behavior to develop a model that adds to the base of knowledge regarding teacher attitudes and how the perceptions of the teachers may have an effect on the student achievement (see Figure 2). This new model focuses on the demographic factors that were reported by teachers who were satisfied or dissatisfied during a renovation project of the building in which they taught. The demographic factors included teaching location, age, gender, number of times a teacher had to relocate their classroom, subject area, and years of experience. This data will add to the Cash model concerning faculty attitude which directly affects student attitude, student behavior, and student achievement. This new model will provide a structure for recommendations that were reported by teachers during the same renovation project. These

measurements could be used by school leadership in decision making strategies during a future renovation project.

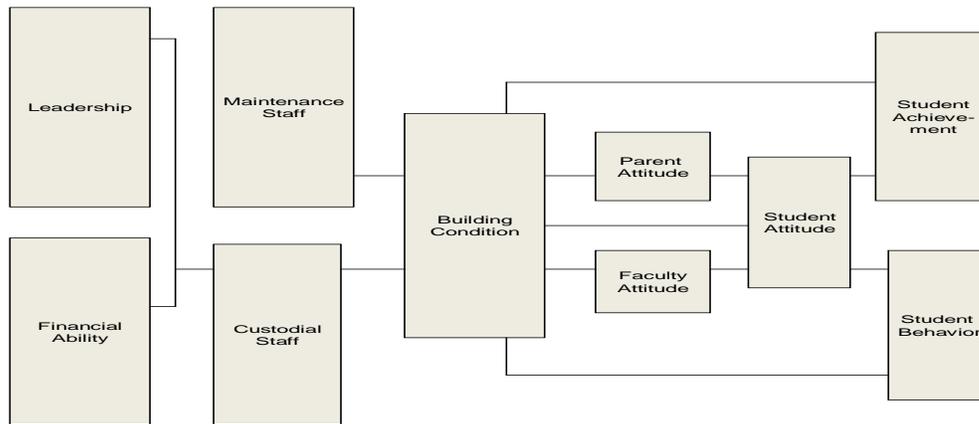


Figure 1. Theoretical model design on the relationship of school building condition and student achievement and behavior.

From: *School Building Condition and Student Achievement and Behavior*, (1993) Carol Cash. Unpublished dissertation. Virginia Polytechnic Institute and State University. Used with permission from Dr. Carol S. Cash.

### Theoretical Model of Teacher Perception during a Renovation Project

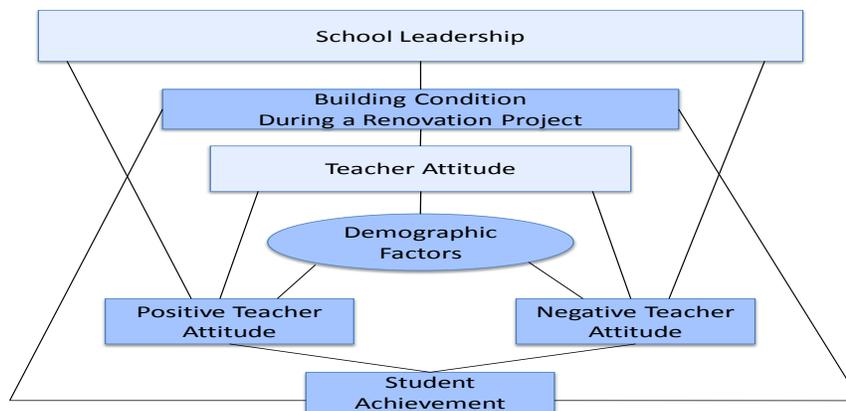


Figure 2. The effect of building conditions and leadership on teacher attitude which effects student achievement.

The theoretical model in Figure 2 involves several links towards a common goal. School leadership plays a major role during a renovation project, influencing the building condition and

the attitudes of teachers through leadership decisions, communication, actions, and attitudes. The condition of the building will be affected to different degrees depending on the severity of the project. School leadership will make decisions that will try to plan for all of the situations that may occur during a renovation project, and those decisions will influence teacher attitudes, either positively or negatively. No matter the effectiveness of the decision making process, changes will occur during a renovation project that will ultimately have a negative or positive effect on teacher attitude or perception and student achievement. The level of effect on attitude and achievement will be unknown until after the renovation has begun, but some precautions can be taken by school leadership and construction leaders to help avoid or lessen teacher dissatisfaction based on demographics factors and perceptions. By proactively addressing these perceptions and demographic factors a leader may influence the teacher perception or attitude, which has been linked to student achievement in previous research.

### **Organization of Study**

Chapter 1 of this study introduces the renovation project that is being researched. It includes the statement of the problem, significance of the study, and research questions that will frame the problem and why the research is conducted. The product of the research is also included and how it may be used by educational leaders. Chapter 2 presents the literature review, which will focus on the relationship of building conditions, leadership, and student achievement. This base of knowledge will set the stage for the relationship of teacher satisfaction and student achievement. Chapter 3 explains the methodology used in data collection, structure of data analysis, and guidelines for interpretation of the data. Chapter 4 describes the data and presents thematical results within this data. Chapter 5 offers conclusions and suggestions for practice while presenting recommendations for further research.

## **Chapter 2**

### **Structure of the Literature Review**

The literature review will provide research that will identify the present level of public school building conditions and the need for renovations to occur in the future. Second, the importance of the condition of a school building related to the learning environment of the students will be addressed. Third, the relationship between the condition of a school building and student achievement will be added. Fourth, the relationship between the leadership of a school and the condition of the building will be identified. The literature review will then examine the levels of teacher satisfaction during renovation projects. And finally, a summary will be included providing the relevance of each relationship and how all of these links form the direction of research towards teacher perspectives of satisfaction and the demographics that are common to these teachers during a renovation project. Only literature from 1986 until the present will be reviewed. Findings from studies that included teacher perspectives on satisfaction and teacher effectiveness during a renovation project will be included.

A variety of databases were used to search for studies pertaining to teacher experiences during school renovation projects. The databases are ERIC from FirstSearch, ERIC from the United States Department of Education (USDOE), Electronic Theses and Dissertations through the Virginia Tech library, National Clearinghouse for Educational Facilities (NCEF), Council of Educational Facility Planners International (CEFPI), and Dissertation Abstracts Online. The search terms that were useful in locating these studies were: renovation projects, teacher experiences, teacher satisfaction, and teacher recommendations.

### **Present Level of Building Conditions**

The United States Department of Education, National Center for Education Statistics [USDOENCES] *Condition of America's Public School Facilities* report stated that there is a shortage of classrooms due to student enrollment increases (2000). The communities are trying to keep up with this demand but the rate of spending is slower than the construction needs. This school survey stated the average age of school buildings was 40 years old and in need of repairs to a multitude of conditions while also having over 30% of the buildings using portable buildings for general classrooms. Earthman (1994) stated the need for renovating our schools and the finances to complete this endeavor are steadily increasing due to the age of the present facilities.

The United States General Accounting Office [USGAO] (1995) estimated that over half of the students attended school buildings that needed at least one major repair to their building. Responses from school officials in 78% of the 10,000 schools surveyed reported that their school was not prepared for the 21<sup>st</sup> century. The NCES (USDOENCES, 2007) *Public School Principals Report on Their School Facilities* reported 46% of the permanent buildings had an interference with classroom instruction due to an environmental factor. Portable buildings were found to have even more interference problems than permanent buildings as related to acoustics, size of classrooms, ceilings, floors, ventilation, and indoor air quality.

McGraw-Hill (2008) provided the following figures to the NCEF concerning the amount of construction in public and private schools nationwide. In the year 2006, 493 new schools were built, 717 schools had additions built, and 1,414 schools had alterations done to their building. In the year 2007, 388 new schools were built, 642 schools had additions built, and 1372 schools were renovated. The data for 2008 were released with the totals through October. New school construction totaled 368, 600 schools had additions built, and 1,420 schools had alterations. These numbers show a great deal of construction occurring in the last few years.

## **Relationship of Building Conditions and Learning Environment**

A school renovation handbook was created by Earthman (1994) to help answer questions and prepare a school division for a renovation project. In Earthman's introduction he described renovation projects as being difficult for the students and staff of a school going through the process. He stated that a renovation project has a considerable displacement on the educational program. Moore and Lackney (1993) discovered a direct relationship between architectural design of a school and educational reform that would also affect the teachers and students' learning environment. Moore and Lackney (1993) concluded that the design patterns of a building have an effect on how well schools are capable of performing. This information placed an importance on the building floor plan itself as a tool for student performance. Moore and Lackney asked for further research to be performed to evaluate the process of implementing these architectural designs that would decrease difficulties for teachers and students, thus giving importance to the problem being researched in this study.

Tuttle (2002) provided a case study on the renovation process of one middle school. A mixed method of qualitative and quantitative research provided a better means of measurement of student performance and a definite description of the renovation needs that can occur during the planning stages. Moore and Warner (1998) noted that student test scores in math and reading had dropped during the construction period and subsequently improved after the completion of the renovation process. Both of these studies indicated that the renovation process will have an effect on the learning environment of the teachers and students.

Moore and Lackney (1993) studied the relationship between the design of a building and educational reform. Their review of literature searched for commonalities between educational reform, architectural designs, and physical environment of the facility. The analysis included 100

buildings from the United States, Canada, England, and other European countries that are considered to be the best designs in the 1980s and early 1990s. A scientific analysis was not used to collect data but instead the researcher collected commonalities of these buildings. They listed 27 design patterns that were common in the three types of literature reviews. Several of these were “supported by empirical research and have been found to contribute to educational achievement” (Moore & Lackney, 1993, p. 5). They only list seven patterns of design for an optimal size of a school building. Three of the seven: small student enrollment in each classroom, cluster of teacher offices, and team suites relate to this study. A renovation project may directly change these three patterns, which would directly affect the learning environment during the renovation process until the optimal designs could be completed in the future.

Young (2003) provided a staff information report for the Tennessee Advisory Commission on Intergovernmental Relations. He stated that socio-economic status cannot be controlled but the physical environment of a building can be controlled. His findings challenged policymakers to consider a change in their process for school improvements that included a clean, safe, and healthy environment for the students and staff.

A list was provided by Young (2003, p. 13) that included physical characteristics that affected the learning environment. These basic requirements of a school building are included in Table 1. He believed that the entire list can be controlled by an administrative leader with a leadership plan and with available funding. Young stated that a performance audit of the school leadership would evaluate the efficiency of the administration and may help increase the public confidence in schools. A school audit would include: addressing operational problems, critiquing personnel, purchasing, food services, transportation, safety, security, technology, and making recommendations regarding these factors. By providing the experiences of teachers,

information can be noted that may reveal a pattern of situations that could be used for prediction within other renovation projects. Young (2003) stated that the factors in Table 1 had an influence on the learning environment for teachers and students: age of facility, condition of facility, thermal factors, the color of the walls, lighting, and air quality.

Table 1

*Physical Characteristics of a School that Directly or Indirectly Affect Learning*

- 
1. External Physical – building foundation and structure, exterior walls, roof, windows, age of building, maintenance, school grounds
  2. Internal Physical – doors, floors, interior walls, ceiling, HVAC system, electrical and plumbing, lighting, maintenance, lockers, storage space
  3. Security and Safety – security guards, weapons screening, ingress and egress, fire control/alarms/resistance, emergency lighting, school order and discipline
  4. Ambient Environmental Health – air circulation/ventilation, indoor air quality, radon, asbestos and lead paint, cleanliness, material safety (lab chemical, cleaning supplies)
  5. Physical Classroom – lighting, acoustical quality, internal/external noise, temperature control, design/arrangement
  6. Psychological – color schemes, graffiti, peeling paint, crumbling plaster, condition of restrooms, broken windows, privacy, size of school, sense of emotional wellbeing
  7. Instructional – teacher, principal, science lab, computers, access to library, curriculum, class size, time in learning
- 

Note. Adapted from “Do K-12 School Facilities Affect Education Outcomes?” by E. Young, 2003, p. 13.

Duke and Griesdorn (1998) studied the practical building factors that impacted the instructional time in the learning environment. About 96% of Virginia’s school systems returned the survey and the results described experiences in five categories: instructional time lost because of facility problems, reduced effectiveness of teaching, reduced curriculum offerings due to facility limitations, state and federal mandates, and health and safety issues which resulted in absenteeism. Teaching instruction and student learning were found to be affected by these conditions and cannot be ignored.

### **Relationship of Building Conditions and Student Achievement**

Two studies (Cash, 1993 and Earthman, 1998a) found a link between student performance and behavior relating to the physical building in which the students are educated. Several environmental factors of a building were scrutinized and all of them were found to have an impact on the students learning as related to standardized test scores. The impact (Earthman, 1998a) of scores on reading, mathematics, written expression, social studies, and science ranged from 5 to 17 percentile points higher in buildings rated as above standard. Hines (1996) replicated Cash's study by using the same instrument and methodology, but the data were collected from large, urban high schools as opposed to Cash's small, rural high schools. Hines found the same range of differences as Cash and Earthman but also found higher differences in reading and mathematic achievement scores from 14 to 17 points higher in buildings rated above standard.

Although guidelines have been provided through research for architectural design, financing, site identification, health and safety of all involved, and management of the construction itself (Earthman, 1994; Moore & Warner, 1998), there is a lack of research on the procedures needed for the principal to maintain a positive learning environment for the teachers. The reviewed literature has found a relationship between the condition of the school building and the achievement levels of the students (Batz, 1998; Earthman, 1986, 1994, 1998a, 2002; Moore and Warner, 1998). These studies document student achievement being negatively affected during the renovation process and also within a building that is deemed to need renovation. These same studies state student achievement as reported in state wide testing was more successful after a building was renovated. Also, student and faculty attendance increased while the number of discipline referrals decreased. The literature addressed the link between building conditions and student achievement but there is limited information regarding how a principal

would manage the renovation project while attempting to maintain teacher satisfaction in order to maintain student achievement levels.

Earthman and Lemasters (1996) reviewed the relationship between a built environment and how it affected student achievement and behavior. Their findings from four studies displayed a direct relationship between these two variables. The four studies were reviews of research (Cash, 1993; Earthman, Cash, & Van Berkum, 1995; Edwards, 1992; Hines, 1996) that included 232 separate research studies. Although the findings ranged from weak to a considerable amount, a link was present. The most important information discovered were the factors that influenced the students' learning. This direct relationship was linked to: "the thermal environment, proper illumination, adequate space, and availability of equipment and furnishings, especially in the subject area of science" (Earthman & Lemasters, 1996, p. 12). All of these factors can be controlled, which would provide control over the learning environment.

Their review suggested that educators and the design team can affect the learning environment. They asked for further research to determine if there is a relationship between administrative leadership and building condition. If this relationship is found then the findings would link administrative leadership directly to the condition of the building and subsequently to student achievement.

Moore and Warner (1998) completed a research survey on Syracuse City School students in New York. They studied the student achievement before, during, and after a renovation project was completed on a facility. They tracked test scores in math and reading for third and sixth grade students over an 11 year period. Their findings showed a relationship between a newer facility and higher math scores. Reading scores were stable during this study. Moore and Warner (1998) found no link to building conditions and reading. They suggested that the

increased enrollment of students who entered during the time of the study who were English as a second language student may have skewed their findings. Their findings also suggested student achievement decreased during the renovation process.

Earthman (2002) provided a summary based on his “own studies, review of pertinent research studies, and background and experience in the field” (p. 4). He found building features such as temperature, lighting, acoustics, and age influence student learning. A negative impact on student achievement was discovered. His review of research noted teachers’ effectiveness in the classroom was also influenced by these same building conditions. Included in this review were a perception questionnaire in 1990 and a descriptive analysis of teachers’ feelings in 1998. He concluded that building conditions do affect student achievement.

If the first three variables: temperature, lighting, and acoustics can affect the student achievement in a regular school day, what might be the effects during a renovation process? Since a definite positive relationship has been found between building conditions and student achievement, a solution to alleviating, eliminating, or correcting these conditions is crucial for a principal.

Earthman and Lemasters (1998) reviewed research by Weinstein in 1979 and McGuffey in 1982. Syntheses from 232 studies were provided by Weinstein and McGuffey. Earthman and Lemasters reported “student achievement scores are higher when windows, floors, heat, roofs, locker conditions, ceilings, laboratory conditions, age of the facility, lighting, interior paint, mopped floors, cosmetic conditions in general were rated above standard by school staffs” (p. 14). Earthman and Lemasters added that these are variables that can be controlled within the educational setting.

Cash and Twiford (2009) provided ten cost effective ways to increase student outcomes. Through their experiences and research, they found that teacher satisfaction is linked to building conditions. One way to affect the teachers' satisfaction is as simple as giving permission to teachers to enhance their classrooms by providing live plants in their classroom. Not only does this help build morale, but studies from the Federal Clean Air Council found that plants increase the oxygen level to a degree that increases productivity in the space by as much as 10% (Jensen, 2003).

### **Relationship of Building Conditions and Leadership**

Principal leadership in a building is a full time job and a renovation project will add a tremendous number of extra concerns and duties for the principal from the start of the project to the very end (Earthman, 1998b). During the renovation of a school building, the principal manages the educational environment and the physical environment in which these renovations take place (Brent & Cianca, 2001). "Without careful planning, continuous communication, and strong leadership, the process of renovating a school can be highly disruptive for teachers and students" (Tuttle, 2002, p. 2).

Brent and Cianca (2002) asked 280 principals about their renovation-related experiences and organized these data into the different types of activities involved in the principals' responsibilities. Their study is directly related to their findings in their previous study (Brent & Cianca, 2001). They found that 80% of these principals were intimately involved with their renovation project. On average, six hours each week were spent on managing renovations and eight hours each week during the summer months of July and August. This represents 10%-15% of the principal's time. This is a tremendous increase in the responsibility already placed on a principal.

The study by Brent and Cianca (2002) further analyzed the data into percentage of time on specific renovation activities. Needs assessment, requirements to address facility and meet educational objectives, garnered 20% of the principal's time during a renovation. Another 18% was spent troubleshooting problems that occurred during the renovation process as shown in Table 2. Brent and Cianca (2002) suggest that these percentages show the renovation process will likely have problems and the principal is responsible for solving them.

Table 2

*Time Spent on Renovations Devoted to Specific Activities*

Activity	Percentage of Total Time
Needs assessment	20
Design	15
Soliciting funds	2
Bidding and contracting	1
Architect consultations	16
Contractor consultations	14
Inspections and approval	10
Troubleshooting	18
Other	4

Note. Adapted from "Why Districts Should Get Principals Involved in Renovation Projects," by B. O. Brent and M. Cianca, 2002, *School Business Affairs*, 68, p. 14.

Although principals felt as if too much time was being spent on the renovation process, they "felt that they were able to influence decisions about renovation projects" (Brent & Cianca, 2002, p. 15). This influence did not outweigh the principals' disappointment in knowing that their time as instructional leader had decreased. The principals' opportunity to prepare their faculty for any distractions and inconveniences which allowed for great communication was seen as a positive attribute regarding their involvement in the process. Overall, Brent and Cianca (2002) found 96% of the principals agreed that their involvement in the renovation process was beneficial.

In conclusion, Brent and Cianca (2002) found that the principals needed more training in order to carry out their responsibilities in an effective manner. The principals selected three types of training that would aid them in managing renovation projects: consultation with facility experts (82%), consultation with experienced principals (85%), and professional workshops (75%). Specific tasks carried out by the principals that occurred during the renovation process included: “closing doors, removing sharp objects, and discouraging crews from smoking, using foul language, and engaging in other inappropriate behaviors” (Brent & Cianca, 2002, p. 15). The principals also found themselves solving conflicts between the custodial staff and construction crew regarding who is responsible for cleaning particular areas. These findings indicated a need and a desire to offer training concerning renovations of a building to principals.

Uline (2000) discussed how principals manage the challenges that they will face during the renovation process. She described three different options for handling this situation:

We can be passive, allowing events to proceed and accept whatever outcomes occur. We can plan with an eye on making it through construction and/or renovations quickly so to avoid inconvenience. But there is another alternative and that is to learn as much as we can for purposes of engaging creativity and utilizing the event of construction for furthering learning objectives and advancing overall educational goals. (p.443)

Uline provided generalities for leadership by the principal but specific procedures were not discussed. Her last statement of using the event as an opportunity to learn is a magnificent idea for a select number of classes. The constraints placed on the teachers by their curriculums and pacing guides may limit their ability to use the renovation process as a learning opportunity.

Cenzi per and Grotto (2003) examined a series of articles written on Florida's Miami and Dade Counties. The articles covered 15 years of statements including interviews and analyses of state construction costs. Over 1,200 projects were analyzed involving new construction, renovation, or additions. Cenziper and Grotto (2003) found the misuse of funds, construction companies that were corrupt, or just plain not knowing what to do hindered most of these projects.

As the building's faults and lack of attention from school leaders were described by Cenziper and Grotto (2003, p. 23), one concern stood out at the end of this compilation: a student stated, "It's like no one pays attention to us. You kind of feel like if they (administration and community) don't care, why should we?" Miami and Dade counties did not have adequate leadership during the renovations and nobody was managing the projects or helping the teachers be successful. The administration could not take care of their responsibilities in providing an adequate building and this was recognized by the students. The lack of leadership was adding to the harmful effects of the building on the learning environment. The student who was quoted appeared to know the link between the leadership and the building even without hard data to back it up.

Earthman's (1998b) article in the *High School Magazine* states a "need for principals to develop a thorough understanding of the renovation process, and more actively engage their staff and community members in it. A more thorough understanding of the renovation process enables a principal to make more informed decisions in the interest of school safety and the educational program" (p. 32). Earthman included two major phases in which the principal was an important player: developing educational specifications and the actual construction work

being carried out. The principal was in charge of keeping the entire renovation process together from beginning to end while continuing to lead the school building educationally.

Brenner (2000) created a list for a principal who will be involved in leading a school during a renovation project to review. Brenner listed such things as asking for advice, making changes in the plan before construction starts, communicating, protecting the students, watching air quality, and realizing the end is really not the end. Brenner's comments and suggestions are relevant to most renovations projects and can be used as a general leadership guide for a principal.

Brenner (2000) concluded that the leadership process is never over. He suggested that a critique of the construction project should be carried out to document successes and failures during the project. This type of detailed documentation could create the necessary changes needed in the future to help avoid conflicts. His statements and advice directed at the principal are helpful but they do not provide a clear leadership plan. Brenner asked for further research in this area to gather knowledge that could fill the gap in the research.

Tuttle (2002) provided a case study of a renovation project of one middle school in Virginia. He summarized his findings to include planning phases of the renovation project. He added suggestions such as completing the project in one year would have less effect on the students and staff of the school versus the project extending into another school year. Limiting the amount of time that the school day was affected would also limit the number of negative situations that would occur.

Guiding principles were included that were discovered in transcripts, surveys, interviews, and photographs. Tuttle's (2002) findings highlighted communicating, maximizing safety, minimizing distractions, staying flexible and creative in problem solving, and linking the

renovation project to the students' learning process. He added outcomes from the study that can be used as a guide for a principal.

Tuttle clearly stated the use of a qualitative method of research that incorporated surveys, interviews, and notes. A quantitative method was also used in comparing Standards of Learning scores before, during, and after the renovation process. This mixed method of study provided a better means of measurement of student performance and a better description of renovation needs for the planning stages.

The participants of the study were only described in a general manner that did not include descriptive detail that could add to the background of the data that were collected. A wide variety of subjects were included to provide for a wide spectrum of information that included the community, students, teachers, administration, architect, and contractors. Personal quotes from the interviews were provided to heighten the validity of the study. Many of the quotes were added as a side bar to the text instead of being imbedded. The findings were clearly organized and substantiated with individual quotes taken from the interviews and directly answer Tuttle's problem statement.

A chapter included in the book School Renovation Handbook: Investing in Education (Earthman, 1994) discussed the responsibilities of a principal during a renovation project. This chapter was one of 12 chapters that served as a leadership guide for a construction project from the beginning decision to renovate to the final evaluation of the renovation project and its adaptations for education. Findings from a renovation project of Madison County High School in Virginia and documentation from Fairfax County Public Schools in Virginia regarding general guidelines for renovating an elementary school were used to create this handbook.

The chapter on principal responsibilities included examples that a principal may encounter during a renovation project. The relationship between the principal and the contractor was included as well as the chain of command that was essential for the school to maintain a student environment that was conducive for learning. Site-based leadership style by the principal was discussed and how it may affect the decision making process for the project. This style of leadership may come into conflict with the overall decision making process of central office administration. The chain of command can be threatened which could hinder decision making and actually hurt the renovation project.

Earthman (1994) continued with providing 14 questions, as shown in Table 3, that need to be answered before the project actually starts. These questions addressed the level of responsibility given to each individual within the chain of command. This proactive approach would provide answers for securing a communication ladder limiting overlapping responsibility guidelines. This entire chapter and some of the 14 questions can be used as a guide for overseeing a renovation project. More examples of specific situations and how they can successfully be solved would allow this chapter to evolve into a leadership guide for a principal.

Table 3

*Questions to Consider When Negotiating Responsibility*

- 
1. How will maintenance funds be equitably allocated to individual school buildings? On what basis-per pupil, square feet, or building need?
  2. Will building principals and staff make the final determination of how maintenance funds will be expended?
  3. Who or what group will identify maintenance needs of the building?
  4. How will the school system achieve economy of scale/volume in bidding projects (i.e., grouping like items for one bid; buying in bulk; obtaining similar services for more than one sit...)?
  5. Who will be allowed to tender bids for maintenance projects?
  6. What maintenance projects will be bid by the building staff or by the maintenance department?
  7. How can the school board guarantee adherence to proper legal procedures when projects are

bid on the building level?

8. Can building principals sign valid contracts for goods and services used in maintenance projects? If so, for what amount?
9. Can principals use funds from sources other than the school system to complete maintenance projects? For example, PTA funds, Band Boosters, Quarterback Club, Pep Club, etc.
10. Who is responsible for inspecting the work of the contractor if the central administration maintenance department does not bid the project?
11. What appeal process is in place to insure that differences between local building and central administration can be resolved in an equitable manner?
12. What kind of staff development will need to be given to the local school building decision makers to help them become knowledgeable about maintenance needs, priorities, and processes?
13. How can the school board guarantee preventative maintenance tasks are completed in a regular and timely fashion if the local school building is making decisions regarding how funds are expended?
14. What kind of staff will the school building principal need to properly take care of all maintenance projects?

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Note. Adapted from “School Renovation Handbook: Investing in Education,” by G. I. Earthman, 1994, p. 120.

Earthman and Draeger (2000) provided a principals’ guide that included planning phases, responsibilities, and unexpected events. This reference is very useful and provided examples with appropriate solutions. They specifically addressed: safeguarding, monitoring procedures, preserving programs, protecting equipment, movement of students, dispute settlement, and minimizing interactions between students and workers. The guidelines were included to help principals’ “manage a renovation project rather than have the renovation process manage them” (p. 36).

The handbook provided by Earthman and Draeger (2000) is a great source of information for problem solving and decision making. The authors make a very important statement: “In many instances, principals are expected to maintain well-run and effective schools during renovations. Yet, the university courses designed to prepare them for the principalship never covered the subject of how principals can maintain academic programs under such difficult and stressful conditions” (p. 5). Their handbook helped close this gap by describing experiences that

will allow the principal to be the mediator between all of the people involved in the renovation process. This reference is a great tool for principals and should be updated to include new findings as well as address the new dilemmas that are occurring in today's school renovation projects.

Within Earthman's (1998b) article, *Renovations: Know the Process, Avoid the Pitfalls*, tips are included for overseeing an efficient renovation project. Green Associates Architects in Evanston, Illinois, collected these tips for principals to use while a renovation project occurs during the school year. The tips (Earthman, 1998b, p. 33) are:

1. Keep everyone informed, review safety procedures frequently as they change, provide clear rules for access for all areas and strictly enforce the policy
2. Make sure all work is done behind locked doors or other barriers, do not hide barriers around corners, exits must remain inside of these construction barriers for the workers
3. Maintain high visibility during arrival and dismissal times as construction crews and equipment may arrive or depart at the same time as the students or staff members
4. Do not store any equipment near corners in the hallway or off the floor
5. Check emergency exits daily and maintain temporary exits as the construction site changes
6. Invite the Board of Health to visit and spot check and recommend improvements
7. Maintain access for contractors during holidays and weekend while providing an efficient identification system for all construction workers, foremen, or architects
8. Assign certain staff members the responsibility for walking the school checking for problems while also securing interior spaces

9. Include the custodial staff in the project so they can facilitate access for the workers and serve as the eyes and ears for the school and student security
10. Talk to parents early and often

Earthman and Draeger (2000, p. 5) found that a principal must effectively manage the following:

1. Interruptions to the educational program are kept to a minimum during the renovation
2. Students, staff members, and school visitors are safe at all times
3. Proper space and equipment is available to the students and teachers when needed
4. School property is secure at all times
5. The school organization is cooperative with the contractor

### **Teacher Satisfaction during Renovation Projects**

Dawson and Parker (1998) completed a qualitative case study of one high school in Louisiana concerning the effects on faculty morale during a renovation of the facility. Data were collected from 10 teachers through interviews, direct observation, and document review. A descriptive analysis was used to present the data. Dawson and Parker's findings included teacher frustration during the renovation process. The authors also noted that the noise and air quality conditions during renovations had a negative effect on the students. Their review of literature suggested a below average facility would include below average achievements. After the project had been completed, the teachers felt that the learning environment during the renovation project could now be overlooked due to the improvements in the building. The methodology was easily found which included 10 out of 67 teachers being interviewed. Each teacher had a personal description provided and why he/she was selected to be included in the study. Data collection

was provided and substantiated with actual interview feedback from the participants.

Triangulation was used to help ensure validity and reliability of the data. Quotes from the participants were also added to help paint a picture to support the findings that would later be included.

Dawson and Parker's conclusions were easily found and understood. The majority of the data spoke highly of the renovations and of the process. However, the decision making process of those in charge was questioned by the teaching staff after the completion of the renovations. Dawson and Parker addressed this dilemma with several possible reasons but could not find the main answer for the interviewees' disgruntled thoughts on the decision making process by the management. Dawson and Parker admitted that their recommendations were limited by time and due to their first attempt of a qualitative study. They suggested a longitudinal study to follow up with this specific situation that would provide a better understanding of the problem. The data would include interview feedback from a longer period of time after the renovation process was completed.

Lackney (2001) encouraged school systems to complete a post-occupancy evaluation of their new building or renovated building. The study included a description of the post-occupancy evaluation process, summary of comments, and recommendations for refining. The analysis of the data provided specific ideas that could be changed from the process that was used by the design architect. This type of study completed as a post-renovation evaluation would provide a summary of comments and recommendations that could be used to create a list of successes and failures within several different renovation settings. The study by Lackney could be adapted to evaluate renovation projects specifically related to their effect on the teachers and their learning environment and not the architectural design.

Schneider (2003) surveyed public school teachers in Chicago and Washington, D.C., to find the effect of school facilities on teaching. His findings included a direct effect of facility conditions on teaching and learning. Facility conditions were also found to affect teachers' health and their decision to remain in the teaching profession. Factors that were identified were: size of school, room inadequacies, air quality, temperature, lighting, noise, and cleanliness. More than 40% of the teachers surveyed said that the conditions of their school caused them to consider changing schools and 30% considered leaving the teaching profession. These decisions may cause a turnover problem and teacher attrition. Benner (2000) found that approximately one-fourth of all new teachers leave the profession within four years.

### **Interpretation of Literature Review**

All of the aforementioned studies form a relationship between renovating a school building and a plan that can be used to oversee this project by a principal. There is a definite link to student achievement and the condition of a building. Statistics from the included research studies have provided many different variables that exist within a school building that affect the success of a student. These same variables are present during a renovation process and may be magnified in some situations. Managing these variables will aid in creating an environment that is conducive for student learning that will provide for teacher and student success.

Not only has the research provided the variables that were linked to student achievement, it has produced a list of renovation variables that would disrupt the learning environment to a greater degree. Ideas and suggestions were provided on how to manage or avoid these situations but specific details were not found regarding teacher attitudes and what common factors may cause these attitudes.

The principal was seen as the management leader for the school during the renovation process. Duties and responsibilities were included along with the relationship of how the principal's leadership could strengthen or weaken the school regarding community, faculty, and students. Training and information regarding a renovation process was seen as a need for principals. The educational background of a principal does not address the leadership skills and knowledge needed to lead a school during a renovation process. More research and training is needed to address this leadership gap and how to address the common factors of teachers during a renovation project. Critiques of renovation projects could provide additional knowledge decreasing the size of this gap.

The review of literature provided evidence that a renovation project is a major event that is directly related to the level of success of the students. There are many variables that require management and manipulation during this process in order to maintain the learning environment for the school. The principal is the leader who will manage these variables while continuing to carry out the usual duties of the job. More knowledge concerning teacher satisfaction during a renovation project could directly affect a decision made by a principal that could affect the outcome of student achievement. Maintaining or increasing student achievement while undergoing renovations to a building should be the goal of every school leader. Teacher satisfaction is an important part of this goal.

### **Summary**

The purpose of this chapter was to review the literature of the present condition of school buildings, the relationship between the condition of school buildings to student achievement, the relationship between the condition of school buildings to school leadership, and teacher perceptions of satisfaction during a renovation project.

## Chapter 3

### Introduction of Methodology

This chapter includes a description of the research design, setting, population, instrumentation, procedures, data analysis, and delimitations. The research answered the following research questions:

1. What were the common perceptions reported by the teachers who had satisfying experiences during a renovation project.
2. What were the common perceptions reported by the teachers who had dissatisfying experiences during a renovation project.
3. Were there any differences in teacher perceptions between the two schools? If so, what were the differences?
4. Were there any relationships between teacher perceptions and the specific demographics? If so, what were they?

### Design

A phenomenological study using non-experimental, descriptive research design was used. The study described commonalities among the participants as they experienced a phenomenon bound by place and time. A quantitative method of research analysis determined if there was a relationship between the different variables and to what degree of strength. The independent variables were the teachers' gender, age, years of teaching experience, school in which they work, frequency of the teachers physically moving their classrooms, and subject areas in which they teach. The data were collected from a survey instrument that was created by the researcher (see Appendix A). The data were self reported by the teachers.

The researcher attempted to find the perceptions common to the teachers that have a relationship with difficult teaching experiences and successful teaching experiences during a renovation project. Augusta County Public Schools will continue to have renovations in their 22 schools. These findings could have an influence on maintaining or improving teaching experiences through school leadership and how the teachers effectively handle these experiences that in turn affect student achievement.

### **Setting**

Augusta County has approximately 65,000 people living inside its borders. Located in the Shenandoah Valley, Augusta County is considered to be a rural place to dwell and raise a family. It is governed by a seven member Board of Supervisors who recently changed a 58 cents tax rate to 48 cents. Manufacturing is one of the main job markets making up 30% of the workforce. Augusta County Public Schools is comprised of approximately 11,000 students within 22 schools including five high schools. A seven member school board is the form of educational government.

Wilson Memorial High School (WMHS) and Stuarts Draft High School (SDHS) were selected for this study due to their identical original floor plans and both being renovated with the same timeline, by the same construction company, and updated using the same floor plan. Both of the schools are almost identical in student population enrollment, racial breakdown, location, physical size, and class offerings. The principals of each high school were newly hired and in their first year of experience as a principal as the renovation projects started. The two schools follow the same county policies, 4 x 4 semester system, use the same standardized tests, and are very close in enrollment size (WMHS – 751, SDHS – 756; 2008 enrollment figures).

All of these factors form a unique opportunity for research to occur. Data were collected on two different populations who had the same opportunity for negative or positive experiences. The survey data of each population were analyzed to find similarities or differences that may lead to recommendations for future renovation projects.

### **Population**

The teacher population used in the survey included the teachers who held full-time teaching positions during the entire duration of the renovation project. Teachers hired after the renovation projects started or teachers who left their school for any reason during the project were not included in the survey population. From the fall of 2006 to the spring of 2008, the teaching faculty who met the requirements for the study for WMHS totaled 42 full time participants and SDHS totaled 34 full time participants. The full time participants were asked to complete the survey during a teacher workday in November or a faculty meeting in December of 2009.

### **Instrumentation**

The survey instrument used in this study was created by the researcher. It was reviewed for clarity by doctoral candidates and then updated by the researcher. The survey instrument was again reviewed by a group of teachers from Kate Collins Middle School who checked for clarity and accuracy of each question. Another update by the researcher followed this second critique. Kate Collins Middle School is located within 18 miles of both of the high schools being researched and had finished its school renovation project within the past two years.

The questions in the survey were constructed to obtain data that were categorized into strongly agree, agree, neutral, disagree, and strongly disagree. The questions included subject matter that was found in past research to be relevant to building conditions. Some of the subject

matter included addressed noise, distractions, odor, safety, climate conditions, construction workers, time involvement, and morale. The survey instrument included 24 total questions. Two of the questions (9 and 10) checked for a change in individual and overall satisfaction. Two questions (23 and 24) allowed the participant to enter an open response in the form of a short written answer about difficult or interesting experiences. The remaining 20 questions covered specific criteria. Ten of the 20 questions were written in a negative manner (2, 4, 6, 8, 11, 15, 16, 20, 21, and 22) and the other ten were written in a positive manner (1, 3, 5, 7, 12, 13, 14, 17, 18, and 19).

The participants' answers were given a numerical score. The questions asked in a positive manner were scored from one to five points. A response of "strongly agree" given for one of these questions received a score of one point while a response of "strongly disagree" received a score of five points. The questions asked in a negative manner were scored from one to five points but in reverse order. A response of "strongly agree" given for one of these questions received a score of five points while a response of "strongly disagree" received a score of one point.

Each participant's score was totaled for these 20 questions and an average score was found and ranked on the following scale:

1.00 - 2.49	Satisfied
2.50 - 3.49	Neutral
3.50 - 5.00	Dissatisfied

Each participant's survey was labeled with its classification of satisfied, neutral, or dissatisfied. The answers provided by each participant for question 9 and 10 were compared to the category in which the average fell. Each survey classification was then compared to the demographic information provided by the participants.

Analyses of the data were run using the Statistical Package for Social Sciences (SPSS). This software package was able to compute descriptive and bivariate statistics, run predictions for numerical outcomes, and calculated relationships between demographic information and survey questions. Descriptive statistics were run to determine distribution and skewness and to identify any outliers in the data. T-tests and ANOVA, analysis of variance, statistics were used to analyze the data across the variables of school, gender, subject area taught, years of experience, number of moves, age, and satisfaction category. If needed, post hoc tests were then executed to provide more detailed information on the data.

### **Procedures**

The research included the procedures for ensuring ethical protocols involving human subjects and that the rights of participants were protected. An Institutional Review Board (IRB) was used to document these procedures. IRB certification was obtained by the researcher (see Appendix B). All required documentation was submitted with a request for approval from the Virginia Tech Institutional Review Board before any research was conducted (see Appendix C).

Confidentiality of the participants included in the research study was maintained during the completion of the survey by the researcher and the completed surveys are locked in a file cabinet at Wilson Memorial High School. The completed surveys will be kept until May 14, 2016. Each teacher who was identified as meeting the criteria for the study was included in the total number of responses that could be obtained. Their names were added to an alphabetized list used by the researcher to document survey completion. A 95% return rate of surveys was used as the requirements for the sample size for the surveyed population. A 97.4% return rate of surveys was acquired by the researcher. Individual names were not included on the survey. If a participant's response was believed to be a threat to herself/himself or others, the researcher

would have notified the appropriate authorities which would have broken confidentiality. This did not occur.

Written approval for administering the survey to the teaching staff of both high schools was obtained from the superintendent of Augusta County Public Schools, Dr. Gary McQuain (see Appendix D). Written approval from the principal at Stuarts Draft High School and each participant was obtained prior to administration of the survey (see Appendices E and F, respectively). Permission to use direct quotes from the essay question on the survey was obtained on the participant consent form. The attempt to maintain participant anonymity had the highest priority although the identity of the participant may be identifiable due to the wording and content of the particular experience included in the essay question. This situation was included in the information in the consent form along with the procedure for masking the identity of the participant by not including the name of the particular school in which an experience occurred.

A meeting was held by the researcher with each population of teachers at each high school to explain the study. Procedures, guidelines, and purpose of the study were distributed and questions were answered at this time. An explanation of the study and survey was given as well as including the benefits that the information may provide. This information could help school leaders create new strategies to help teachers be successful in the future. Confidentiality procedures were discussed and approval from each participant was gathered at this meeting. The participants were supplied information concerning their rights as participants, to insure that their involvement in the study was voluntary and that they had the option to withdraw at anytime. There was no compensation for participation in this study for anyone. The responsibility of the participant was the agreement to answer the questions honestly. Participants who were absent

from the initial meeting were contacted by the researcher to complete a survey on another assigned date.

Collection of the completed surveys at each school was different. One SDHS administrator was present during the meeting at SDHS for introduction purposes only. The researcher and SDHS administrator were the only non participants in the room from the beginning of the study explanation to collection of the surveys. The researcher had the SDHS teachers place their surveys in a box as they left the location. Only the researcher had access to these surveys.

Since the researcher is the principal at WMHS, a different series of events occurred for the second collection. One assistant principal was present with the participants but did not complete the survey. The researcher explained the study, IRB procedures, IRB safeguards, obtained IRB permission, and answered any questions that the participants asked. The researcher left the location and remained in the main office until the surveys were transferred from the assistant principal. The assistant principal was in charge of distributing the surveys once the researcher had left. The assistant principal was also responsible for having each survey placed in a box as the participants left the location. Upon the completion by all of the participants, the assistant principal immediately took the box of surveys to the main office and transferred the box to the researcher. These procedures aided the anonymity process during the completion of the surveys by removing the researcher who is the principal in charge of the participants at WMHS.

### **Data Analysis**

After the collection of the completed participant survey data, descriptive statistics were run on each question using a likert scale to calculate frequency, distribution, skewness, and to

identify any outliers if present. A likert scale used a specific rating for an answer. The researcher used a likert scale that included a choice of one of five answers: strongly agree, agree, neutral, disagree, and strongly disagree. By looking at the distribution of the data for each question, the researcher did not discover any outliers or missing data. Data that were considered to be outliers were those that did not match one of the possible choices for an answer.

Statistical Package for Social Sciences (SPSS) software was used to process the data. All of the research questions and tests used for analysis were investigated at the .05 level of significance. This means that any differences found in the data will only have a 5% probability of occurring due to chance. Crosstabulation tables for each question were reported as well. These tables included the frequency of answers on the likert scale selected for each question distributed in the demographic categories.

The data were examined using Pearson's product moment correlation coefficient which describes the relationship between the variables and the strength of their association. The coefficient is a score on the scale between -1 and 1. As the score approaches either of these extremes on the scale, the relationship between the questions and demographic variable become stronger.

The data were also examined using Cohen's *d*. Cohen's *d* measured the strength of the apparent relationship between two variables as a descriptive statistic. The following scale was used to determine effect size: 0 – 3.49 (weak), 3.50 – 7.49 (moderate), and 7.50 - 2.00 (strong). The symbol of *d* was used as the standardized measure within the data reports as effect size was discussed. Cohen (1988) defined effect size as the difference between means divided by the standard deviation for the data. Cohen is generally given credit for this interpretation and how effect size can be used as an estimation in another population. He used an effect size scale of

.2 to .3 would be small, close to .5 would be medium, and greater than .8 would be large. Cohen (1988, p. 25) stated “the terms ‘small’, ‘medium’, and ‘large’ are relative, not only to each other, but to the area of behavioral science or even more particularly to the specific content and research method being employed in any given investigation”.

Independent sample t-tests and one-way ANOVAs were employed to analyze the data for research questions 1 and 2. Independent t-tests were employed to analyze the data for research question 3. Independent t-tests, one-way ANOVAs, and Correlations were employed to analyze the data for research question 4. The independent sample t-test was employed because it is the best test to evaluate the means of two independent groups and their differences. A one-way ANOVA was employed to evaluate individual scores on two variables while labeling one of the variables as the independent variable and the other as the dependent variable.

### **Delimitations / Limitations**

One limitation for this study included the time that the participant survey was completed. The data collected in the survey instrument was collected 10 months after the completion of the renovation project at both schools. The completion of the project with only a punch list of remaining items occurred in the winter of 2008 and the collection of data occurred in the winter of 2009. Therefore the memory of the participants may have been blurred by the lapse of time. What memories remained may have been the ones that the participants found to have the greatest impact on them.

A delimitation used by the researcher was the number of participants included in the teacher survey. The population size only included the teachers who were employed for the entire duration of the renovation project. The researcher did not survey teachers who were hired after the renovation project began or those who left before the renovation project was completed. This

decreased the chance for outlier data from the participants while also including only participants who had the opportunity to experience every aspect of the renovation project and not just a small portion of the renovation project. The researcher only selected two rural high schools that were being renovated during the same time. Schools located in other geographical locations were not included as well as schools that were renovated during a different period of time.

### **Summary**

The purpose of this chapter was to describe the methodology of this study. This phenomenological study consisted of a non-experimental descriptive research design, setting, detailed description of the population, instrumentation used, data collection procedures and analysis using SPSS software, delimitations, and limitations.

## Chapter 4

### Introduction of Findings

This chapter presents and examines the research findings for this study. Demographic information concerning the population are presented (see Appendix G). Survey responses and subsequent satisfaction classification for each participant are included. Microsoft Excel was used for data entry and satisfaction classification calculations. The spreadsheet of data was then loaded into the Statistical Package for Social Sciences (SPSS) software program for all analyses. Each research question is presented including the analyses results that pertain directly to it.

### Demographics for Survey Respondents

**School and gender.** Of the 76 potential respondents originally meeting the criteria for the questionnaire, 74 completed the questionnaire providing a 97.4% return rate. SDHS teachers made up 46% of the population while WMHS had 54%. Approximately 45% of the population was male and 55% of the population was female as shown in Table 4.

Table 4

#### *Questionnaire Demographics by School and Gender*

School	Total Possible Questionnaires	Questionnaires Completed	Percent of Questionnaire Completion	Male		Female	
				N	%	N	%
Stuarts Draft	34	34	100	16	47	18	53
Wilson Memorial	42	40	95.2	17	42.5	23	57.5
Total	76	74	97.4	33	45	41	55

**School and age.** The population consisted of five different age categories as shown in Table 5. The total population had the highest number of members within the 46-55 age category

or 32%. The next highest category was the age category of 26-35 years at 24%. The lowest age category for the population was from 21-25 years old at 12%. The 21-25 year category also had the smallest span of years.

Table 5

*Questionnaire Demographics by School and Age Category*

School	21-25		26-35		36-45		46-55		56+	
	N	%	N	%	N	%	N	%	N	%
Stuarts	3	9	11	32	5	15	9	26	6	18
Draft										
Wilson	6	15	7	17	7	17	15	38	5	13
Memorial										
Total	9	12	18	24	12	16	24	33	11	15

**School and number of classroom moves.** The population was divided into six categories according to how many times participants had to move their classroom as shown in Table 6. The category of two moves had the highest amount of moves overall for both schools. The category with the lowest number of moves was the zero moves category and both schools had the identical number of participants.

Table 6

*Questionnaire Demographics by School and Number of Moves*

School	0 Moves		1 Move		2 Moves		3 Moves		4 Moves		5 or More Moves	
	N	%	N	%	N	%	N	%	N	%	N	%
Stuarts	3	9	6	18	11	33	4	12	4	12	6	18
Draft												
Wilson	3	8	5	13	21	53	4	9	4	9	3	8
Memorial												
Total	6	8	11	15	32	43	8	11	8	11	9	12

**School and subject area taught by teacher.** The population was divided into six categories regarding the subject area taught by each participant shown in Table 7.

Approximately 43% of the population was in the category labeled “other” which included subject areas in foreign language, Family and Consumer Science, business, technology, agriculture, GED, health and physical education, and special education. The second highest category was math with 15%. The lowest category was Fine Arts with only 8%.

Table 7

*Questionnaire Demographics by School and Subject Area Taught*

School	Math		English		Social Studies		Science		Fine Arts		Other	
	N	%	N	%	N	%	N	%	N	%	N	%
Stuarts Draft	5	15	3	9	3	9	5	15	4	12	14	40
Wilson Memorial	6	15	6	15	4	10	4	10	2	5	18	45
Total	11	15	9	12	7	9	9	12	6	8	32	44

**School and years of teaching experience.** The population was divided into three categories regarding years of teaching experience as shown in Table 8. The “7 or more years” category was the largest with 54 (73%). This category also had the largest span of years. The second largest category was “0 to 3 years” with 12 (16%) and the “4 to 6 years” was the lowest with 8 (11%).

Table 8

*Questionnaire Demographics by School and Years of Teaching Experience*

School	0-3 Years		4-6 Years		7 or More Years	
	N	%	N	%	N	%
Stuarts Draft	5	15	4	12	25	73

Wilson Memorial	7	18	4	10	29	73
Total	12	16	8	11	54	73

**Survey scores and codes.** Each survey was given a number for identification purposes but it was not linked to the participant's name. An average score was calculated for each survey number and the overall perception score was coded on the following scale:

1.00 - 2.49	“S” = Satisfied
2.50 - 3.49	“N” = Neutral
3.50 - 5.00	“D” = Dissatisfied

Survey number, score, and code were included as well as the overall mean and standard deviation as shown in Appendix K. Only three surveys had an overall score that was coded as “D” for dissatisfied. Forty-four surveys had an overall score that were coded as “N” for neutral. Twenty-seven surveys had an overall score that were coded as “S” for satisfied. The perception codes for each survey were used within several tests seen later in the study.

**Responses to each survey question.** The following are the data results from the survey questions. The actual data is documented in Appendices H and I. The data are categorized for each available response including the frequencies, percentiles, and mean scores for each question. The responses are not divided by any demographic information but reflect the total population.

Question 1 asked the participants if sufficient time was provided for them to be prepared as a teacher for each phase of the project. The data in Table 9 show the results with a mean score of 2.34 or a response of “agree”. The mean for the question matched the individual response with the highest percentage which was 47.3% for “agree”. The lowest response category was “strongly disagree” with 2.7%.

Question 2 asked the participants if they individually felt that the renovation project caused more time than normal to be spent on preparing to teach the class. The data in Table 9 show the results with a mean score of 2.74 or a response of “neutral”. The mean for the question did not match the individual response with the highest percentage which was 41.9% for “agree”. The lowest response category was “strongly disagree” with 1.4%.

Question 3 asked the participants if they individually felt safe during the renovation project. The data in Table 9 show the results with a mean score of 2.35 or a response of “agree”. The mean for the question matched the individual response with the highest percentage which was 37.8% for “agree”. The lowest response category was “strongly disagree” with 1.4%.

Question 4 asked the participants if they individually did not like the number of disruptions in the class caused by the renovation project. The data in Table 9 show the results with a mean score of 2.38 or a response of “agree”. The mean for the question matched the individual response with the highest percentage which was 39.2% for “agree”. The lowest response category was “strongly disagree” with 1.4%.

Question 5 asked the participants if availability and use of technology in the classroom was not affected by the renovation project. The data in Table 9 show the results with a mean score of 3.47 or a response of “disagree”. The mean for the question matched the individual response with the highest percentage which was 39.2% for “disagree”. The lowest response category was “strongly agree” with 5.4%.

Question 6 asked the participants if more stress was felt during the project than before or after the project. The data in Table 9 show the results with a mean score of 2.43 or a response of “agree”. The mean for the question matched the individual response with the highest percentage which was 32.4% for “agree”. The lowest response category was “strongly disagree” with 6.8%.

Question 7 asked the participants if the learning environment in their individual room was not affected by the project. The data in Table 9 show the results with a mean score of 3.81 or a response of “disagree”. The mean for the question matched the individual response with the highest percentage which was 48.6% for “disagree”. The lowest response category was “neutral” with 1.4%.

Question 8 asked the participants if the noise level during the renovation project annoyed them individually. The data in Table 9 show the results with a mean score of 2.34 or a response of “agree”. The mean for the question matched the individual response with the highest percentage which was 50.0% for “agree”. The lowest response category was “strongly disagree” with 1.4%.

Question 9 asked the participants if their individual teaching satisfaction was not affected in any way by the renovation project. The data in Table 9 show the results with a mean score of 3.24 or a response of “neutral”. The mean for the question did not match the individual response with the highest percentage which was 39.2% for “disagree”. The lowest response category was “strongly agree” with 4.1%.

Question 10 asked the participants if the overall teacher morale remained the same during the project. The data in Table 9 show the results with a mean score of 3.36 or a response of “neutral”. The mean for the question did not match the individual response with the highest percentage which was 41.9% for “disagree”. The lowest response category was “strongly agree” with 1.4%.

Question 11 asked the participants if the cleanliness of the school negatively affected their individual satisfaction as a teacher. The data in Table 9 show the results with a mean score of 2.65 or a response of “neutral”. The mean for the question did not match the individual

response with the highest percentage which was 32.4% for “neutral” and “agree”. The lowest response category was “strongly disagree” with 2.7%.

Question 12 asked the participants if they individually were satisfied with their job before the renovation project. The data in Table 9 show the results with a mean score of 1.88 or a response of “agree”. The mean for the question matched the individual response with the highest percentage which was 51.4% for “agree”. The lowest response category was “strongly disagree” with 0.0%.

Question 13 asked the participants if they individually were satisfied with their job during the renovation project. The data in Table 9 show the results with a mean score of 2.28 or a response of “agree”. The mean for the question matched the individual response with the highest percentage which was 47.3% for “agree”. The lowest response category was “strongly disagree” with 2.7%.

Question 14 asked the participants if they individually were satisfied with their job since the completion of the renovation project. The data in Table 9 show the results with a mean score of 1.69 or a response of “agree”. The mean for the question did not match the individual response with the highest percentage which was 50.0% for “strongly agree”. The lowest response category was “strongly disagree” with 1.4%.

Question 15 asked the participants if another renovation project were to occur at their school, would they individually seek a transfer to another school. The data in Table 9 show the results with a mean score of 4.09 or a response of “disagree”. The mean for the question did not match the individual response with the highest percentage which was 44.6% for “strongly disagree”. The lowest response category was “agree” with 2.7%.

Question 16 asked the participants if they individually considered relocating to another school during the renovation project due to the renovation project. The data in Table 9 show the results with a mean score of 4.41 or a response of “disagree”. The mean for the question did not match the individual response with the highest percentage which was 51.4% for “strongly disagree”. The lowest response category was “agree” with 0.0%.

Question 17 asked the participants if they individually would rate the school as a good place to work before the renovation project. The data in Table 9 show the results with a mean score of 1.95 or a response of “agree”. The mean for the question matched the individual response with the highest percentage which was 62.2% for “agree”. The lowest response category was “strongly disagree” with 1.4%.

Question 18 asked the participants if they individually would rate the school as a good place to work during the renovation project. The data in Table 9 show the results with a mean score of 2.39 or a response of “agree”. The mean for the question matched the individual response with the highest percentage which was 50.0% for “agree”. The lowest response category was “strongly disagree” with 5.4%.

Question 19 asked the participants if they individually would rate the school as a good place to work after the renovation project. The data in Table 9 show the results with a mean score of 1.73 or a response of “agree”. The mean for the question matched the individual response with the highest percentage which was 52.7% for “agree”. The lowest response category was “strongly disagree” with 0.0%.

Question 20 asked the participants if they individually experienced difficulties that were directly caused by individual construction workers. The data in Table 9 show the results with a mean score of 3.93 or a response of “disagree”. The mean for the question did not match the

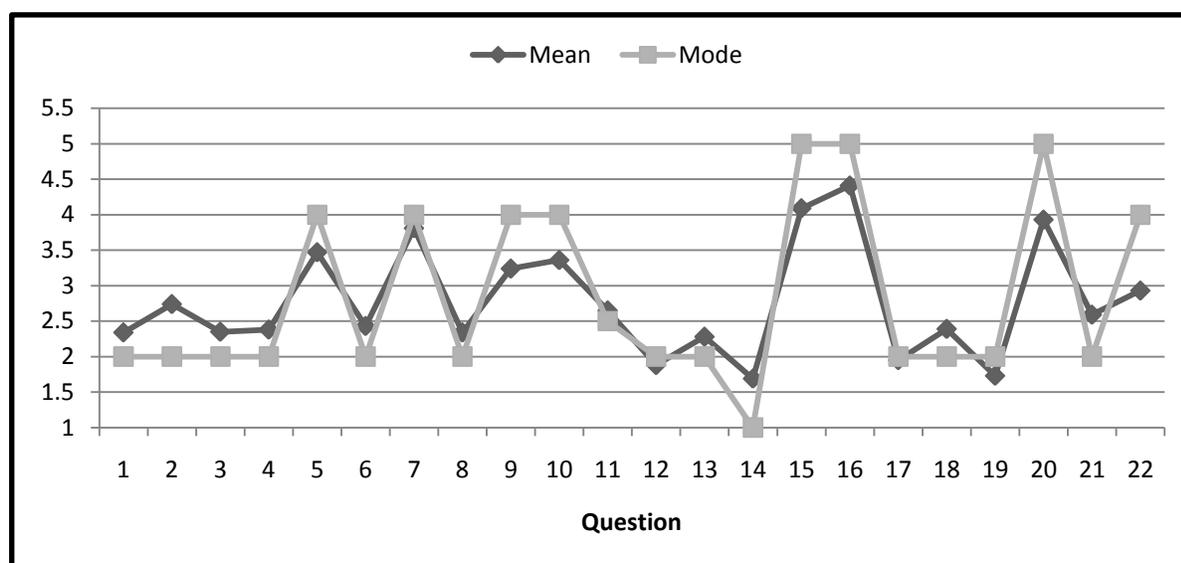
individual response with the highest percentage which was 40.5% for “strongly disagree”. The lowest response category was “strongly agree” with 5.4%.

Question 21 asked the participants if their individual satisfaction was negatively affected by the room temperature during the renovation project. The data in Table 9 show the results with a mean score of 2.59 or a response of “neutral”. The mean for the question did not match the individual response with the highest percentage which was 27.0% for “agree”. The lowest response category was “strongly disagree” with 9.5%.

Question 22 asked the participants if they individually felt that odors caused by the renovation project negatively affected satisfaction. The data in Table 9 show the results with a mean score of 2.93 or a response of “neutral”. The mean for the question did not match the individual response with the highest percentage which was 27.0% for “disagree”. The lowest response category was “strongly disagree” with 10.8%.

Table 9

*Descriptives for Questionnaire Responses*



## Data Analysis

**Research question 1.** What were the common perceptions reported by the teachers who had satisfying experiences during a renovation project?

**Research question 2.** What were the common perceptions reported by the teachers who had dissatisfying experiences during a renovation project?

A total of 74 surveys were analyzed to answer research question 1 and 2. A total of 27 surveys had a calculated score between 1 and 2.49 which coded the surveys as having a “satisfied” perception and a total number of three surveys had a calculated score between 3.50 and 5 which coded the surveys as having a “dissatisfied” perception on the overall renovation project as shown in Appendix K. The number of “satisfied” surveys made up 36.5% of the total amount of surveys and “dissatisfied” surveys made up 4%.

A Pearson Correlation test was conducted among all three of the satisfaction codes and each survey question. A correlation describes the strength between two variables and whether or not one variable may predict the value of the other variable. The calculated value of Pearson’s  $r$  can have a value anywhere between -1 and 1. As the calculated value approaches either extreme, the association between the two variables becomes stronger. A significance level of  $p < .05$  was used for this test. The correlations as shown in Table 10 indicate a linear relationship between questions 1 through 22 (except for question 5) and the overall satisfaction code. Survey question 5 did not meet the requirements of the level of significance.

Table 10

### *Intercorrelations Among Overall Satisfaction Code and Survey Question*

	Satisfaction Code	Mean	Standard Deviation
Satisfaction Code	–	1.68	.552

Question 1	.296*	2.34	1.101
Question 2	-.369**	2.74	1.021
Question 3	.574**	2.35	.971
Question 4	-.438**	2.38	1.016
Question 5	.189	3.47	1.230
Question 6	-.522**	2.43	1.171
Question 7	.427**	3.81	1.131
Question 8	-.371**	2.34	.997
Question 9	.624**	3.24	1.108
Question 10	.300**	3.36	1.054
Question 11	-.591**	2.65	1.026
Question 12	.291*	1.88	.776
Question 13	.566**	2.28	1.000
Question 14	.406**	1.69	.890
Question 15	-.656**	4.09	1.088
Question 16	-.648**	4.41	.739
Question 17	.417**	1.95	.757
Question 18	.432**	2.39	1.057
Question 19	.257*	1.73	.727
Question 20	-.448**	3.93	1.197
Question 21	-.557**	2.59	1.281
Question 22	-.547**	2.93	1.253

\* Correlation is significant at the  $p < .05$  level (2-tailed)

\*\* Correlation is significant at the  $p < .01$  level (2-tailed)

An Analysis of Variance (ANOVA) test was conducted on each question across the three levels of overall satisfaction codes. The ANOVA is a global test of differences. The between groups within the ANOVA was significant at the  $p < .05$  level for all of the questions except question 1 and question 5. A Bonferroni post hoc analysis was then conducted to find the individual means and if significance existed. Questions 2, 3, 4, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21 and 22 had significance. The results are shown in Table 11 through Table 50.

Table 11

*Summary of 1 x 3 ANOVA for Satisfaction Code vs. Survey Question 2 - I felt that the renovation project caused me to spend more time than normal preparing to teach my class.*

Source	Sum of Squares	df	Mean Square	F	Effect Size
Between Groups	11.411	2	5.706	6.260*	.150
Within Groups	64.710	71	.911		
Total	76.122	73			

\*  $p < .05$

Table 12

*Bonferroni Comparison for Satisfaction Code and Question 2*

Comparisons	Mean	Std. Error	95% Confidence Interval for Mean	
	Difference		Lower Bound	Upper Bound
Satisfied vs. Neutral	.557	.233	-.02	1.13
Satisfied vs. Dissatisfied	1.815*	.581	.39	3.24
Neutral vs. Dissatisfied	1.258	.570	-.14	2.65

\*  $p < .05$

These tests were completed to see if there was a difference in satisfaction codes and survey question 2. The total population consisted of 74 surveys with 27 (36.5%) Satisfied, 44 (59.5%) Neutral, and 3 (4%) Dissatisfied.

An alpha level of 0.05 was used for all statistical tests and  $d$  was calculated as the effect size. A 1 x 3 analysis of variance (ANOVA) was calculated on satisfaction code and question 2. The analysis was significant,  $F(2, 71) = 6.260, p < .05$  ( $p = .008$ ). The effect size,  $d = .150$ , shows the relationship was weak. Post hoc analyses using the Bonferroni post hoc criterion for significance indicated that Satisfied ( $M = 3.15, SD = .864$ ) were significantly different in question 2 with Dissatisfied ( $M = 1.33, SD = .577$ ).

Table 13

*Summary of 1 x 3 ANOVA for Satisfaction Code vs. Survey Question 3 – I felt safe during the renovation project.*

Source	Sum of Squares	df	Mean Square	$F$	Effect Size
Between Groups	22.653	2	11.326	17.402*	.329
Within Groups	46.212	71	.651		
Total	68.865	73			

\*  $p < .05$

Table 14

*Bonferroni Comparison for Satisfaction Code and Question 3*

Comparisons	Mean Difference	Std. Error	95% Confidence Interval for Mean	
			Lower Bound	Upper Bound
Satisfied vs. Neutral	-1.015*	.197	-1.50	-.53
Satisfied vs. Dissatisfied	-2.000*	.491	-3.20	-.80
Neutral vs. Dissatisfied	-.985	.481	-2.17	.20

\*  $p < .05$

These tests were completed to see if there was a difference in satisfaction codes and survey question 3. The total population consisted of 74 surveys with 27 (36.5%) Satisfied, 44 (59.5%) Neutral, and 3 (4%) Dissatisfied.

An alpha level of 0.05 was used for all statistical tests and  $d$  was calculated as the effect size. A 1 x 3 analysis of variance (ANOVA) was calculated on satisfaction code and question 3. The analysis was significant,  $F(2, 71) = 17.402$ ,  $p < .05$  ( $p = .000$ ). The effect size,  $d = .329$ , shows the relationship was weak. Post hoc analyses using the Bonferroni post hoc criterion for significance indicated that Satisfied ( $M = 1.67$ ,  $SD = .620$ ) were significantly different in question 3 with Neutral ( $M = 2.68$ ,  $SD = .909$ ) and Dissatisfied ( $M = 3.67$ ,  $SD = .577$ ).

Table 15

*Summary of 1 x 3 ANOVA for Satisfaction Code vs. Survey Question 4 – I did not like the number of disruptions in my class caused by the renovation project.*

Source	Sum of Squares	df	Mean Square	$F$	Effect Size
Between Groups	16.428	2	8.214	9.889*	.218
Within Groups	58.977	71	.831		
Total	75.405	73			

\*  $p < .05$

Table 16

*Bonferroni Comparison for Satisfaction Code and Question 4*

Comparisons	Mean Difference	Std. Error	95% Confidence Interval for Mean	
			Lower Bound	Upper Bound
Satisfied vs. Neutral	.977*	.223	.43	1.52
Satisfied vs. Dissatisfied	1.000	.555	-.36	2.36
Neutral vs. Dissatisfied	.023	.544	-1.31	1.36

\*  $p < .05$

These tests were completed to see if there was a difference in satisfaction codes and survey question 4. The total population consisted of 74 surveys with 27 (36.5%) Satisfied, 44 (59.5%) Neutral, and 3 (4%) Dissatisfied.

An alpha level of 0.05 was used for all statistical tests and  $d$  was calculated as the effect size. A 1 x 3 analysis of variance (ANOVA) was calculated on satisfaction code and question 4. The analysis was significant,  $F(2, 71) = 9.889$ ,  $p < .05$  ( $p = .000$ ). The effect size,  $d = .218$ , shows the relationship was weak. Post hoc analyses using the Bonferroni post hoc criterion for significance indicated that Satisfied ( $M = 3.00$ ,  $SD = .920$ ) were significantly different in question 4 with Neutral ( $M = 2.02$ ,  $SD = .902$ ).

Table 17

*Summary of 1 x 3 ANOVA for Satisfaction Code vs. Survey Question 6 – I felt more stress during the project than before or after the project.*

Source	Sum of Squares	df	Mean Square	$F$	Effect Size
Between Groups	31.737	2	15.869	16.466*	.317
Within Groups	68.425	71	.964		
Total	100.162	73			

\*  $p < .05$

Table 18

*Bonferroni Comparison for Satisfaction Code and Question 6*

Comparisons	Mean Difference	Std. Error	95% Confidence Interval for Mean	
			Lower Bound	Upper Bound
Satisfied vs. Neutral	1.364*	.240	.78	1.95
Satisfied vs. Dissatisfied	1.296	.597	-.17	2.76
Neutral vs. Dissatisfied	-.068	.586	-1.50	1.37

\*  $p < .05$

These tests were completed to see if there was a difference in satisfaction codes and survey question 6. The total population consisted of 74 surveys with 27 (36.5%) Satisfied, 44 (59.5%) Neutral, and 3 (4%) Dissatisfied.

An alpha level of 0.05 was used for all statistical tests and  $d$  was calculated as the effect size. A 1 x 3 analysis of variance (ANOVA) was calculated on satisfaction code and question 6. The analysis was significant,  $F(2, 71) = 16.466$ ,  $p < .05$  ( $p = .000$ ). The effect size,  $d = .317$ , shows the relationship was weak. Post hoc analyses using the Bonferroni post hoc criterion for significance indicated that Satisfied ( $M = 3.30$ ,  $SD = 1.068$ ) were significantly different in question 6 with Neutral ( $M = 1.93$ ,  $SD = .925$ ).

Table 19

*Summary of 1 x 3 ANOVA for Satisfaction Code vs. Survey Question 7 – The learning environment in my room was not affected by the project.*

Source	Sum of Squares	df	Mean Square	$F$	Effect Size
Between Groups	17.429	2	8.714	8.149*	.187
Within Groups	75.923	71	1.069		
Total	93.351	73			

\*  $p < .05$

Table 20

*Bonferroni Comparison for Satisfaction Code and Question 7*

Comparisons	Mean Difference	Std. Error	95% Confidence Interval for Mean	
			Lower Bound	Upper Bound
Satisfied vs. Neutral	-.951*	.253	-1.57	-.33
Satisfied vs. Dissatisfied	-1.481	.629	-3.02	.06
Neutral vs. Dissatisfied	-.530	.617	-2.04	.98

\*  $p < .05$

These tests were completed to see if there was a difference in satisfaction codes and survey question 7. The total population consisted of 74 surveys with 27 (36.5%) Satisfied, 44 (59.5%) Neutral, and 3 (4%) Dissatisfied.

An alpha level of 0.05 was used for all statistical tests and  $d$  was calculated as the effect size. A 1 x 3 analysis of variance (ANOVA) was calculated on satisfaction code and question 7. The analysis was significant,  $F(2, 71) = 8.149, p < .05$  ( $p = .001$ ). The effect size,  $d = .187$ , shows the relationship was weak. Post hoc analyses using the Bonferroni post hoc criterion for significance indicated that Satisfied ( $M = 3.19, SD = 1.210$ ) were significantly different in question 7 with Neutral ( $M = 4.14, SD = .930$ ).

Table 21

*Summary of 1 x 3 ANOVA for Satisfaction Code vs. Survey Question 8 – The noise level during the renovation project annoyed me.*

Source	Sum of Squares	df	Mean Square	$F$	Effect Size
Between Groups	10.177	2	5.088	5.792*	.140
Within Groups	62.377	71	.879		
Total	72.554	73			

\*  $p < .05$

Table 22

*Bonferroni Comparison for Satisfaction Code and Question 8*

Comparisons	Mean Difference	Std. Error	95% Confidence Interval for Mean	
			Lower Bound	Upper Bound
Satisfied vs. Neutral	.724*	.229	.16	1.29
Satisfied vs. Dissatisfied	1.148	.570	-.25	2.55
Neutral vs. Dissatisfied	.424	.559	-.95	1.80

\*  $p < .05$

These tests were completed to see if there was a difference in satisfaction codes and survey question 8. The total population consisted of 74 surveys with 27 (36.5%) Satisfied, 44 (59.5%) Neutral, and 3 (4%) Dissatisfied.

An alpha level of 0.05 was used for all statistical tests and  $d$  was calculated as the effect size. A 1 x 3 analysis of variance (ANOVA) was calculated on satisfaction code and question 8. The analysis was significant,  $F(2, 71) = 5.792$ ,  $p < .05$  ( $p = .005$ ). The effect size,  $d = .140$ , shows the relationship was weak. Post hoc analyses using the Bonferroni post hoc criterion for significance indicated that Satisfied ( $M = 2.81$ ,  $SD = 1.039$ ) were significantly different in question 8 with Neutral ( $M = 2.09$ ,  $SD = .884$ ).

Table 23

Summary of 1 x 3 ANOVA for Satisfaction Code vs. Survey Question 9 – Overall, I felt that my teaching satisfaction was not affected in any way by the renovation project.

Source	Sum of Squares	df	Mean Square	$F$	Effect Size
Between Groups	38.265	2	19.132	26.450*	.427
Within Groups	51.357	71	.723		
Total	89.622	73			

\*  $p < .05$

Table 24

Bonferroni Comparison for Satisfaction Code and Question 9

Comparisons	Mean Difference	Std. Error	95% Confidence Interval for Mean	
			Lower Bound	Upper Bound
Satisfied vs. Neutral	-1.476*	.208	-1.99	-.97
Satisfied vs. Dissatisfied	-1.704*	.518	-2.97	-.43
Neutral vs. Dissatisfied	-.227	.507	-1.47	1.02

\*  $p < .05$

These tests were completed to see if there was a difference in satisfaction codes and survey question 9. The total population consisted of 74 surveys with 27 (36.5%) Satisfied, 44 (59.5%) Neutral, and 3 (4%) Dissatisfied.

An alpha level of 0.05 was used for all statistical tests and  $d$  was calculated as the effect size. A 1 x 3 analysis of variance (ANOVA) was calculated on satisfaction code and question 9. The analysis was significant,  $F(2, 71) = 26.450, p < .05$  ( $p = .000$ ). The effect size,  $d = .427$ , shows the relationship was moderate. Post hoc analyses using the Bonferroni post hoc criterion for significance indicated that Satisfied ( $M = 2.30, SD = .823$ ) were significantly different in question 9 with Neutral ( $M = 3.77, SD = .859$ ) and Dissatisfied ( $M = 4.00, SD = 1.000$ ).

Table 25

*Summary of 1 x 3 ANOVA for Satisfaction Code vs. Survey Question 10 – I felt that the overall teacher morale remained the same during the project.*

Source	Sum of Squares	df	Mean Square	$F$	Effect Size
Between Groups	8.542	2	4.271	4.176*	.105
Within Groups	72.607	71	1.023		
Total	81.149	73			

\*  $p < .05$

Table 26

*Bonferroni Comparison for Satisfaction Code and Question 10*

Comparisons	Mean Difference	Std. Error	95% Confidence Interval for Mean	
			Lower Bound	Upper Bound
Satisfied vs. Neutral	-.440	.247	-1.05	.17
Satisfied vs. Dissatisfied	-1.630*	.615	-3.14	-.12
Neutral vs. Dissatisfied	-1.189	.603	-2.67	.29

\*  $p < .05$

These tests were completed to see if there was a difference in satisfaction codes and survey question 10. The total population consisted of 74 surveys with 27 (36.5%) Satisfied, 44 (59.5%) Neutral, and 3 (4%) Dissatisfied.

An alpha level of 0.05 was used for all statistical tests and  $d$  was calculated as the effect size. A 1 x 3 analysis of variance (ANOVA) was calculated on satisfaction code and question 10. The analysis was significant,  $F(2, 71) = 4.176$ ,  $p < .05$  ( $p = .019$ ). The effect size,  $d = .105$ , shows the relationship was weak. Post hoc analyses using the Bonferroni post hoc criterion for significance indicated that Satisfied ( $M = 3.04$ ,  $SD = .940$ ) were significantly different in question 10 with Dissatisfied ( $M = 4.67$ ,  $SD = .577$ ).

Table 27

*Summary of 1 x 3 ANOVA for Satisfaction Code vs. Survey Question 11 – The cleanliness of the school negatively affected my satisfaction as a teacher.*

Source	Sum of Squares	df	Mean Square	$F$	Effect Size
Between Groups	27.804	2	13.902	20.119*	.362
Within Groups	49.061	71	.691		
Total	76.865	73			

\*  $p < .05$

Table 28

*Bonferroni Comparison for Satisfaction Code and Question 11*

Comparisons	Mean Difference	Std. Error	95% Confidence Interval for Mean	
			Lower Bound	Upper Bound
Satisfied vs. Neutral	1.271*	.203	.72	1.72
Satisfied vs. Dissatisfied	1.778*	.506	.54	3.02
Neutral vs. Dissatisfied	.561	.496	-.66	1.78

\*  $p < .05$

These tests were completed to see if there was a difference in satisfaction codes and survey question 11. The total population consisted of 74 surveys with 27 (36.5%) Satisfied, 44 (59.5%) Neutral, and 3 (4%) Dissatisfied.

An alpha level of 0.05 was used for all statistical tests and  $d$  was calculated as the effect size. A 1 x 3 analysis of variance (ANOVA) was calculated on satisfaction code and question 11. The analysis was significant,  $F(2, 71) = 20.119$ ,  $p < .05$  ( $p = .000$ ). The effect size,  $d = .362$ , shows the relationship was moderate. Post hoc analyses using the Bonferroni post hoc criterion for significance indicated that Satisfied ( $M = 3.44$ ,  $SD = .847$ ) were significantly different in question 11 with Neutral ( $M = 2.23$ ,  $SD = .831$ ) and Dissatisfied ( $M = 1.67$ ,  $SD = .577$ ).

Table 29

*Summary of 1 x 3 ANOVA for Satisfaction Code vs. Survey Question 12 – Before the renovation project, I was satisfied with my job.*

Source	Sum of Squares	df	Mean Square	$F$	Effect Size
Between Groups	4.443	2	2.222	3.997*	.101
Within Groups	39.462	71	.556		
Total	43.905	73			

\*  $p < .05$

Table 30

*Bonferroni Comparison for Satisfaction Code and Question 12*

Comparisons	Mean Difference	Std. Error	95% Confidence Interval for Mean	
			Lower Bound	Upper Bound
Satisfied vs. Neutral	-.513*	.182	-.96	-.07
Satisfied vs. Dissatisfied	-.444	.454	-1.56	.67
Neutral vs. Dissatisfied	.068	.445	-1.02	1.16

\*  $p < .05$

These tests were completed to see if there was a difference in satisfaction codes and survey question 12. The total population consisted of 74 surveys with 27 (36.5%) Satisfied, 44 (59.5%) Neutral, and 3 (4%) Dissatisfied.

An alpha level of 0.05 was used for all statistical tests and  $d$  was calculated as the effect size. A 1 x 3 analysis of variance (ANOVA) was calculated on satisfaction code and question 12. The analysis was significant,  $F(2, 71) = 3.997$ ,  $p < .05$  ( $p = .023$ ). The effect size,  $d = .101$ , shows the relationship was weak. Post hoc analyses using the Bonferroni post hoc criterion for significance indicated that Satisfied ( $M = 1.56$ ,  $SD = .751$ ) were significantly different in question 12 with Neutral ( $M = 2.07$ ,  $SD = .661$ ).

Table 31

*Summary of 1 x 3 ANOVA for Satisfaction Code vs. Survey Question 13 – During the renovation project, I was satisfied with my job.*

Source	Sum of Squares	df	Mean Square	$F$	Effect Size
Between Groups	23.821	2	11.910	17.181*	.326
Within Groups	49.220	71	.693		
Total	73.041	73			

\*  $p < .05$

Table 32

*Bonferroni Comparison for Satisfaction Code and Question 13*

Comparisons	Mean Difference	Std. Error	95% Confidence Interval for Mean	
			Lower Bound	Upper Bound
Satisfied vs. Neutral	-1.104*	.204	-1.60	-.60
Satisfied vs. Dissatisfied	-1.778*	.507	-3.02	-.54
Neutral vs. Dissatisfied	-.674	.497	-1.89	.54

\*  $p < .05$

These tests were completed to see if there was a difference in satisfaction codes and survey question 13. The total population consisted of 74 surveys with 27 (36.5%) Satisfied, 44 (59.5%) Neutral, and 3 (4%) Dissatisfied.

An alpha level of 0.05 was used for all statistical tests and  $d$  was calculated as the effect size. A 1 x 3 analysis of variance (ANOVA) was calculated on satisfaction code and question 13. The analysis was significant,  $F(2, 71) = 17.181$ ,  $p < .05$  ( $p = .000$ ). The effect size,  $d = .326$ , shows the relationship was weak. Post hoc analyses using the Bonferroni post hoc criterion for significance indicated that Satisfied ( $M = 1.56$ ,  $SD = .577$ ) were significantly different in question 13 with Neutral ( $M = 2.66$ ,  $SD = .963$ ) and Dissatisfied ( $M = 3.33$ ,  $SD = .577$ ).

Table 33

*Summary of 1 x 3 ANOVA for Satisfaction Code vs. Survey Question 14 – Since the completion of the renovation project, I have been satisfied with my job.*

Source	Sum of Squares	df	Mean Square	$F$	Effect Size
Between Groups	12.026	2	6.013	9.316*	.208
Within Groups	45.826	71	.645		
Total	57.851	73			

\*  $p < .05$

Table 34

*Bonferroni Comparison for Satisfaction Code and Question 14*

Comparisons	Mean Difference	Std. Error	95% Confidence Interval for Mean	
			Lower Bound	Upper Bound
Satisfied vs. Neutral	-.462	.196	-.94	.02
Satisfied vs. Dissatisfied	-2.000*	.489	-3.20	-.80
Neutral vs. Dissatisfied	-1.538*	.479	-2.71	-.36

\*  $p < .05$

These tests were completed to see if there was a difference in satisfaction codes and survey question 14. The total population consisted of 74 surveys with 27 (36.5%) Satisfied, 44 (59.5%) Neutral, and 3 (4%) Dissatisfied.

An alpha level of 0.05 was used for all statistical tests and  $d$  was calculated as the effect size. A 1 x 3 analysis of variance (ANOVA) was calculated on satisfaction code and question 14. The analysis was significant,  $F(2, 71) = 9.316$ ,  $p < .05$  ( $p = .000$ ). The effect size,  $d = .208$ , shows the relationship was weak. Post hoc analyses using the Bonferroni post hoc criterion for significance indicated that Satisfied ( $M = 1.33$ ,  $SD = .679$ ) were significantly different in question 14 with Dissatisfied ( $M = 3.33$ ,  $SD = 2.082$ ). Neutral ( $M = 1.80$ ,  $SD = .765$ ) was also significantly different with Dissatisfied ( $M = 3.33$ ,  $SD = 2.082$ ).

Table 35

*Summary of 1 x 3 ANOVA for Satisfaction Code vs. Survey Question 15 – If another renovation project were to occur at your school, would you seek a transfer to another school?*

Source	Sum of Squares	df	Mean Square	$F$	Effect Size
Between Groups	39.277	2	19.639	29.629*	.455
Within Groups	47.061	71	.663		
Total	86.338	73			

\*  $p < .05$

Table 36

*Bonferroni Comparison for Satisfaction Code and Question 15*

Comparisons	Mean Difference	Std. Error	95% Confidence Interval for Mean	
			Lower Bound	Upper Bound
Satisfied vs. Neutral	1.116*	.199	.63	1.60
Satisfied vs. Dissatisfied	3.222*	.495	2.01	4.44
Neutral vs. Dissatisfied	2.106*	.486	.91	3.30

\*  $p < .05$

These tests were completed to see if there was a difference in satisfaction codes and survey question 15. The total population consisted of 74 surveys with 27 (36.5%) Satisfied, 44 (59.5%) Neutral, and 3 (4%) Dissatisfied.

An alpha level of 0.05 was used for all statistical tests and  $d$  was calculated as the effect size. A 1 x 3 analysis of variance (ANOVA) was calculated on satisfaction code and question 15. The analysis was significant,  $F(2, 71) = 29.629$ ,  $p < .05$  ( $p = .000$ ). The effect size,  $d = .455$ , shows the relationship was moderate. Post hoc analyses using the Bonferroni post hoc criterion for significance indicated that Satisfied ( $M = 4.89$ ,  $SD = .320$ ) were significantly different in question 15 with Neutral ( $M = 3.77$ ,  $SD = .985$ ) and Dissatisfied ( $M = 1.67$ ,  $SD = 1.155$ ). Neutral ( $M = 3.77$ ,  $SD = .985$ ) was also significantly different with Dissatisfied ( $M = 1.67$ ,  $SD = 1.155$ ).

Table 37

*Summary of 1 x 3 ANOVA for Satisfaction Code vs. Survey Question 16 – During the renovation project, I considered relocating to another school due to the renovation project.*

Source	Sum of Squares	df	Mean Square	$F$	Effect Size
Between Groups	20.255	2	10.127	36.717*	.508
Within Groups	19.583	71	.276		
Total	39.838	73			

\*  $p < .05$

Table 38

*Bonferroni Comparison for Satisfaction Code and Question 16*

Comparisons	Mean	Std. Error	95% Confidence Interval for Mean	
	Difference		Lower Bound	Upper Bound
Satisfied vs. Neutral	.639*	.128	.32	.95
Satisfied vs. Dissatisfied	2.556*	.320	1.77	3.34
Neutral vs. Dissatisfied	1.917*	.313	1.15	2.69

\*  $p < .05$

These tests were completed to see if there was a difference in satisfaction codes and survey question 16. The total population consisted of 74 surveys with 27 (36.5%) Satisfied, 44 (59.5%) Neutral, and 3 (4%) Dissatisfied.

An alpha level of 0.05 was used for all statistical tests and  $d$  was calculated as the effect size. A 1 x 3 analysis of variance (ANOVA) was calculated on satisfaction code and question 16. The analysis was significant,  $F(2, 71) = 36.717$ ,  $p < .05$  ( $p = .000$ ). The effect size,  $d = .508$ , shows the relationship was moderate. Post hoc analyses using the Bonferroni post hoc criterion for significance indicated that Satisfied ( $M = 4.89$ ,  $SD = .320$ ) were significantly different in question 16 with Neutral ( $M = 4.25$ ,  $SD = .576$ ) and Dissatisfied ( $M = 2.33$ ,  $SD = 1.155$ ). Neutral ( $M = 4.25$ ,  $SD = .576$ ) was also significantly different with Dissatisfied ( $M = 2.33$ ,  $SD = 1.155$ ).

Table 39

*Summary of 1 x 3 ANOVA for Satisfaction Code vs. Survey Question 17 – Overall, before the renovation project, I would rate the school as a good place to work.*

Source	Sum of Squares	df	Mean Square	<i>F</i>	Effect Size
Between Groups	14.245	2	7.123	18.363*	.341
Within Groups	27.539	71	.388		
Total	41.784	73			

\*  $p < .05$

Table 40

*Bonferroni Comparison for Satisfaction Code and Question 17*

Comparisons	Mean Difference	Std. Error	95% Confidence Interval for Mean	
			Lower Bound	Upper Bound
Satisfied vs. Neutral	-.251	.152	-.62	.12
Satisfied vs. Dissatisfied	-2.296*	.379	-3.23	-1.37
Neutral vs. Dissatisfied	-2.045*	.372	-2.96	-1.13

\*  $p < .05$

These tests were completed to see if there was a difference in satisfaction codes and survey question 17. The total population consisted of 74 surveys with 27 (36.5%) Satisfied, 44 (59.5%) Neutral, and 3 (4%) Dissatisfied.

An alpha level of 0.05 was used for all statistical tests and  $d$  was calculated as the effect size. A 1 x 3 analysis of variance (ANOVA) was calculated on satisfaction code and question 17. The analysis was significant,  $F(2, 71) = 18.363$ ,  $p < .05$  ( $p = .000$ ). The effect size,  $d = .341$ , shows the relationship was weak. Post hoc analyses using the Bonferroni post hoc criterion for significance indicated that Satisfied ( $M = 1.70$ ,  $SD = .609$ ) were significantly different in

question 17 with Dissatisfied ( $M = 4.00$ ,  $SD = 1.000$ ). Neutral ( $M = 1.95$ ,  $SD = .608$ ) was also significantly different with Dissatisfied ( $M = 4.00$ ,  $SD = 1.000$ ).

Table 41

*Summary of 1 x 3 ANOVA for Satisfaction Code vs. Survey Question 18 – Overall, during the renovation project, I would rate the school as a good place to work.*

Source	Sum of Squares	df	Mean Square	<i>F</i>	Effect Size
Between Groups	15.349	2	7.674	8.220*	.188
Within Groups	66.286	71	.934		
Total	81.635	73			

\*  $p < .05$

Table 42

*Bonferroni Comparison for Satisfaction Code and Question 18*

Comparisons	Mean Difference	Std. Error	95% Confidence Interval for Mean	
			Lower Bound	Upper Bound
Satisfied vs. Neutral	-.867*	.236	-1.45	-.29
Satisfied vs. Dissatisfied	-1.519*	.588	-2.96	-.08
Neutral vs. Dissatisfied	-.652	.577	-2.07	.76

\*  $p < .05$

These tests were completed to see if there was a difference in satisfaction codes and survey question 18. The total population consisted of 74 surveys with 27 (36.5%) Satisfied, 44 (59.5%) Neutral, and 3 (4%) Dissatisfied.

An alpha level of 0.05 was used for all statistical tests and  $d$  was calculated as the effect size. A 1 x 3 analysis of variance (ANOVA) was calculated on satisfaction code and question 18. The analysis was significant,  $F(2, 71) = 8.220$ ,  $p < .05$  ( $p = .001$ ). The effect size,  $d = .188$ , shows the relationship was weak. Post hoc analyses using the Bonferroni post hoc criterion for

significance indicated that Satisfied ( $M = 1.81$ ,  $SD = .681$ ) were significantly different in question 18 with Neutral ( $M = 2.68$ ,  $SD = 1.116$ ) and Dissatisfied ( $M = 3.333$ ,  $SD = .577$ ).

Table 43

*Summary of 1 x 3 ANOVA for Satisfaction Code vs. Survey Question 19 – Overall, after the renovation project, I would rate the school as a good place to work.*

Source	Sum of Squares	df	Mean Square	<i>F</i>	Effect Size
Between Groups	5.349	2	2.674	5.711*	.139
Within Groups	33.246	71	.468		
Total	38.595	73			

\*  $p < .05$

Table 44

*Bonferroni Comparison for Satisfaction Code and Question 19*

Comparisons	Mean Difference	Std. Error	95% Confidence Interval for Mean	
			Lower Bound	Upper Bound
Satisfied vs. Neutral	-.135	.167	-.54	.28
Satisfied vs. Dissatisfied	-1.407*	.416	-2.43	-.39
Neutral vs. Dissatisfied	-1.273*	.408	-2.27	-.27

\*  $p < .05$

These tests were completed to see if there was a difference in satisfaction codes and survey question 19. The total population consisted of 74 surveys with 27 (36.5%) Satisfied, 44 (59.5%) Neutral, and 3 (4%) Dissatisfied.

An alpha level of 0.05 was used for all statistical tests and  $d$  was calculated as the effect size. A 1 x 3 analysis of variance (ANOVA) was calculated on satisfaction code and question 19. The analysis was significant,  $F(2, 71) = 5.711$ ,  $p < .05$  ( $p = .005$ ). The effect size,  $d = .139$ , shows the relationship was weak. Post hoc analyses using the Bonferroni post hoc criterion for significance indicated that Satisfied ( $M = 1.59$ ,  $SD = .747$ ) were significantly different in

question 19 with Dissatisfied ( $M = 3.00$ ,  $SD = 1.000$ ). Neutral ( $M = 1.73$ ,  $SD = .624$ ) was also significantly different with Dissatisfied ( $M = 3.00$ ,  $SD = 1.000$ ).

Table 45

*Summary of 1 x 3 ANOVA for Satisfaction Code vs. Survey Question 20 – I experienced difficulties that were directly caused by individual construction workers.*

Source	Sum of Squares	df	Mean Square	<i>F</i>	Effect Size
Between Groups	21.442	2	10.721	9.147*	.205
Within Groups	83.220	71	1.172		
Total	104.662	73			

\*  $p < .05$

Table 46

*Bonferroni Comparison for Satisfaction Code and Question 20*

Comparisons	Mean Difference	Std. Error	95% Confidence Interval for Mean	
			Lower Bound	Upper Bound
Satisfied vs. Neutral	.896*	.265	.25	1.55
Satisfied vs. Dissatisfied	2.222*	.659	.61	3.84
Neutral vs. Dissatisfied	1.326	.646	-.26	2.91

\*  $p < .05$

These tests were completed to see if there was a difference in satisfaction codes and survey question 20. The total population consisted of 74 surveys with 27 (36.5%) Satisfied, 44 (59.5%) Neutral, and 3 (4%) Dissatisfied.

An alpha level of 0.05 was used for all statistical tests and  $d$  was calculated as the effect size. A 1 x 3 analysis of variance (ANOVA) was calculated on satisfaction code and question 20. The analysis was significant,  $F(2, 71) = 9.147$ ,  $p < .05$  ( $p = .000$ ). The effect size,  $d = .205$ , shows the relationship was weak. Post hoc analyses using the Bonferroni post hoc criterion for

significance indicated that Satisfied ( $M = 4.56$ ,  $SD = .698$ ) were significantly different in question 20 with Neutral ( $M = 3.66$ ,  $SD = 1.180$ ) and Dissatisfied ( $M = 2.33$ ,  $SD = 2.309$ ).

Table 47

*Summary of 1 x 3 ANOVA for Satisfaction Code vs. Survey Question 21 – My satisfaction was negatively affected by my room temperature during the renovation project.*

Source	Sum of Squares	df	Mean Square	<i>F</i>	Effect Size
Between Groups	42.342	2	21.171	19.396*	.353
Within Groups	77.496	71	1.091		
Total	119.838	73			

\*  $p < .05$

Table 48

*Bonferroni Comparison for Satisfaction Code and Question 21*

Comparisons	Mean Difference	Std. Error	95% Confidence Interval for Mean	
			Lower Bound	Upper Bound
Satisfied vs. Neutral	1.570*	2.55	.94	2.20
Satisfied vs. Dissatisfied	1.593*	.636	.03	3.15
Neutral vs. Dissatisfied	.023	.623	-1.55	1.51

\*  $p < .05$

These tests were completed to see if there was a difference in satisfaction codes and survey question 21. The total population consisted of 74 surveys with 27 (36.5%) Satisfied, 44 (59.5%) Neutral, and 3 (4%) Dissatisfied.

An alpha level of 0.05 was used for all statistical tests and  $d$  was calculated as the effect size. A 1 x 3 analysis of variance (ANOVA) was calculated on satisfaction code and question 21. The analysis was significant,  $F(2, 71) = 19.396$ ,  $p < .05$  ( $p = .000$ ). The effect size,  $d = .353$ , shows the relationship was moderate. Post hoc analyses using the Bonferroni post hoc criterion

for significance indicated that Satisfied ( $M = 3.59$ ,  $SD = 1.118$ ) were significantly different in question 21 with Neutral ( $M = 2.02$ ,  $SD = 1.000$ ) and Dissatisfied ( $M = 2.00$ ,  $SD = 1.000$ ).

Table 49

*Summary of 1 x 3 ANOVA for Satisfaction Code vs. Survey Question 22 – Odors caused by the renovation project negatively affected my satisfaction.*

Source	Sum of Squares	df	Mean Square	<i>F</i>	Effect Size
Between Groups	36.459	2	18.230	16.551*	.318
Within Groups	78.203	71	1.101		
Total	114.662	73			

\*  $p < .05$

Table 50

*Bonferroni Comparison for Satisfaction Code and Question 22*

Comparisons	Mean Difference	Std. Error	95% Confidence Interval for Mean	
			Lower Bound	Upper Bound
Satisfied vs. Neutral	1.420*	.257	.79	2.05
Satisfied vs. Dissatisfied	1.852*	.639	.29	3.42
Neutral vs. Dissatisfied	.432	.626	-1.10	1.97

\*  $p < .05$

These tests were completed to see if there was a difference in satisfaction codes and survey question 22. The total population consisted of 74 surveys with 27 (36.5%) Satisfied, 44 (59.5%) Neutral, and 3 (4%) Dissatisfied.

An alpha level of 0.05 was used for all statistical tests and  $d$  was calculated as the effect size. A 1 x 3 analysis of variance (ANOVA) was calculated on satisfaction code and question 22. The analysis was significant,  $F(2, 71) = 16.551$ ,  $p < .05$  ( $p = .000$ ). The effect size,  $d = .318$ , shows the relationship was weak. Post hoc analyses using the Bonferroni post hoc criterion for

significance indicated that Satisfied ( $M = 3.85$ ,  $SD = .989$ ) were significantly different in question 22 with Neutral ( $M = 2.43$ ,  $SD = 1.087$ ) and Dissatisfied ( $M = 2.00$ ,  $SD = 1.000$ ).

**Research question 3.** Were there any differences in teacher perceptions in the two schools? If so, what were the differences?

A total of 74 surveys were analyzed to answer research question 3. A total of 34 surveys from SDHS accounted for 46% of the data. A total of 40 surveys from WMHS accounted for 54% of the data. Crosstabulations, Pearson's Correlation, and a t-test were employed to analyze the data for this research question.

Table 51

*Summary of Satisfaction Code and School*

	Satisfied		Neutral		Dissatisfied		Total
	N	%	N	%	N	%	
Stuarts Draft	16	47	16	47	2	6	34
Wilson Memorial	11	28	28	70	1	2	40
Total	27	36	44	60	3	4	74

The results from Table 51 show a difference in the teacher perceptions between the two schools. The teachers from SDHS had 47% of the faculty coded as satisfied compared to 28% for WMHS. The majority of the teachers at WMHS were coded as neutral at 70%. The dissatisfied teachers only accounted for 4% of the total population with SDHS having two participants at 6% and WMHS having one participant at 2%.

The results from Table 52 show the number of participants by gender within each school and their specific satisfaction code. The percentages are based upon the demographic variable of

gender within each school. The SDHS females were more satisfied (N = 7, 39%) than the WMHS females (N = 4, 17%) who were coded as predominantly neutral (N = 18, 78%). The SDHS males were more satisfied (N = 9, 56%) than the WMHS males (N = 7, 41%).

Table 52

*Crosstabulations of Satisfaction Code and School and Gender*

		Satisfied		Neutral		Dissatisfied	
		N	Category %	N	Category %	N	Category %
Male	SDHS	9	56	6	38	1	6
	WMHS	7	41	10	59	0	0
Female	SDHS	7	39	10	56	1	6
	WMHS	4	17	18	78	1	4
Total		27		44		3	

The results from Table 53 show the number of participants by age within each school and their specific satisfaction code. The percentages are based upon the demographic variable of age within each school. A higher percentage of participants in the 21 – 25 age category were satisfied at SDHS (N = 2, 67%) compared to WMHS (N = 2, 33%). A higher percentage of participants in the 26 – 35 age category were satisfied at SDHS (N = 6, 55%) compared to WMHS (N = 1, 14%). A higher percentage of participants in the 36 – 45 age category were coded as neutral at WMHS (N = 5, 71%) compared to SDHS (N = 1, 20%). The same was also found for the 46 – 55 age category with WMHS (N = 11, 73%) having a higher percentage than SDHS (N = 4, 44%). WMHS had a higher percentage in the over 56 year old category (N = 2, 40%) for satisfied than SDHS (N = 0, 0%).

Table 53

*Crosstabulations of Satisfaction Code and School and Age*

Age Category		Satisfied		Neutral		Dissatisfied	
		N	Category %	N	Category %	N	Category %
Age 21-25	SDHS	2	67	1	33	0	0
	WMHS	2	33	4	67	0	0
Age 26-35	SDHS	6	55	4	36	1	9
	WMHS	1	14	5	72	1	14
Age 36-45	SDHS	4	80	1	20	0	0
	WMHS	2	29	5	71	0	0
Age 46-55	SDHS	4	44	4	44	1	12
	WMHS	4	27	11	73	0	0
Over 56 yrs. old	SDHS	0	0	6	100	0	0
	WMHS	2	40	3	60	0	0
Total		27		44		3	

The results from Table 54 show the number of participants by number of moves within each school and their specific satisfaction code. The percentages are based upon the demographic variable of number of moves within each school. Participants who moved one time were more satisfied at SDHS (N = 4, 67%) than at WMHS (N = 1, 20%) as well as three moves at SDHS (N = 3, 75%) compared to WMHS (N = 1, 25%) and five moves at SDHS (N = 4, 67%) compared to WMHS (N = 1, 33%). All three of the dissatisfied participants moved two times during the renovation project.

Table 54

*Crosstabulations of Satisfaction Code and School and Number of Moves*

Number of Moves		Satisfied		Neutral		Dissatisfied	
		N	Category %	N	Category %	N	Category %
0 Moves	SDHS	1	33	2	67	0	0
	WMHS	1	33	2	67	0	0
1 Move	SDHS	4	67	2	33	0	0
	WMHS	1	20	4	80	0	0
2 Moves	SDHS	3	27	6	55	2	18
	WMHS	6	29	14	67	1	4
3 Moves	SDHS	3	75	1	25	0	0
	WMHS	1	25	3	75	0	0
4 Moves	SDHS	1	25	3	75	0	0
	WMHS	1	25	3	75	0	0
5 or More Moves	SDHS	4	67	2	33	0	0
	WMHS	1	33	2	67	0	0
Total		27		44		3	

The results from Table 55 show the number of participants by subject taught within each school and their specific satisfaction code. The percentages are based upon the demographic variable of subject taught within each school. The subject areas of math and other did not have major differences. A higher percentage of the participants who taught English were satisfied at SDHS (N = 2, 67%) than at WMHS (N = 1, 17%) where most were coded as neutral (N = 5, 83%). The subject area of science found a higher percentage of satisfied participants at SDHS (N = 2, 40%) than at WMHS (N = 0, 0%) where most were coded as neutral (N = 3, 75%). The area of fine arts found a higher percentage of satisfied participants at WMHS (N = 2, 100%) compared to SDHS (N = 2, 50%).

Table 55

*Crosstabulations of Satisfaction Code and School and Subject Taught*

Subject Taught		Satisfied		Neutral		Dissatisfied	
		N	Category %	N	Category %	N	Category %
Math	SDHS	1	20	4	80	0	0
	WMHS	1	17	5	83	0	0
English	SDHS	2	67	0	0	1	33
	WMHS	1	17	5	83	0	0
Social Studies	SDHS	2	67	1	33	0	0
	WMHS	1	25	3	75	0	0
Science	SDHS	2	40	3	60	0	0
	WMHS	0	0	3	75	1	25
Fine Arts	SDHS	2	50	1	25	1	25
	WMHS	2	100	0	0	0	0
Other	SDHS	7	50	7	50	0	0
	WMHS	6	33	12	67	0	0
Total		27		44		3	

The results from Table 56 show the number of participants by years of teaching experience within each school and their specific satisfaction code. The percentages are based upon the demographic variable of years of teaching experience within each school. All three categories had one participant who was dissatisfied. The category of 0 – 3 years of experience had a higher percentage of satisfied participants at SDHS (N = 2, 40%) than WMHS (N = 2, 29%) where most were coded as neutral (N = 5, 71%). There were no major differences in percentages within the other two categories.

Table 56

*Crosstabulations of Satisfaction Code and School and Years of Teaching Experience*

Years of Teaching Experience		Satisfied		Neutral		Dissatisfied	
		N	Category %	N	Category %	N	Category %
0-3	SDHS	2	40	2	40	1	20
	WMHS	2	29	5	71	0	0
4-6	SDHS	3	75	1	25	0	0
	WMHS	2	50	2	50	0	0
7 or More	SDHS	11	44	13	52	1	4
	WMHS	7	24	21	72	1	4
Total		27		44		3	

An independent sample t-test was carried out between SDHS and WMHS on each survey question. The test revealed that there was a statistically significant difference between SDHS and WMHS for question 3 which addressed safety,  $t(74) = (-3.616)$ ,  $p < .05$  ( $p = .001$ ). The mean of SDHS ( $M = 1.94$ ,  $SD = .814$ ) was lower than the mean of WMHS ( $M = 2.70$ ,  $SD = 1.018$ ). The effect size,  $d$ , was computed to be .392, which is a moderate effect size. The results from the t-test are shown in Table 57.

The test also revealed that there was a statistically significant difference between SDHS and WMHS for question 22 regarding odor,  $t(74) = (3.222)$ ,  $p < .05$  ( $p = .002$ ). The mean of SDHS ( $M = 3.41$ ,  $SD = 1.184$ ) was higher than the mean of WMHS ( $M = 2.52$ ,  $SD = 1.176$ ). The effect size,  $d$ , was computed to be .355, which is a moderate effect size. The results from the t-test are shown in Table 57.

Table 57

*Group Differences between School and Survey Question*

Question	Stuarts Draft		Wilson Memorial		df	<i>t</i>
	M	SD	M	SD		
1	2.12	1.066	2.52	1.109	72	-1.602
2	2.79	1.038	2.70	1.018	72	.393
3	1.94	.814	2.70	.966	72	-3.616*
4	2.59	1.184	2.20	.823	72	1.657
5	3.53	1.187	3.42	1.279	72	.362
6	2.59	1.184	2.30	1.159	72	1.056
7	3.79	1.200	3.82	1.083	72	-.116
8	2.56	1.078	2.15	.893	72	1.784
9	3.09	1.138	3.38	1.079	72	-1.111
10	3.59	.957	3.18	1.107	72	1.702
11	2.56	1.078	2.72	.987	72	-.692
12	1.71	.629	2.02	.862	72	-1.790
13	2.21	.946	2.34	1.051	72	-.615
14	1.76	.987	1.62	.807	72	.670
15	4.15	1.019	4.05	1.154	72	.380
16	4.44	.660	4.38	.807	72	.382
17	2.03	.717	1.88	.791	72	.874
18	2.35	.981	2.42	1.130	72	-.290
19	1.79	.687	1.68	.764	72	.700
20	4.15	.989	3.75	1.335	72	1.432
21	2.88	1.274	2.35	1.252	72	1.809
22	3.41	1.184	2.52	1.176	72	3.222*

\*  $p < .05$

A Pearson's Correlation test was employed to check for relationships between each school and satisfaction code, age, gender, number of moves, subject taught, and years of experience. The test revealed no significance at the  $p < .05$  level for any of these variables.

**Research question 4.** Were there any relationships between teacher perceptions and the specific demographics? If so, what were they?

**Gender and survey questions.** An independent sample t-test was completed on gender and each survey question. The analysis showed significance for survey questions 3, 11, 13, 14, 18, 19, 20, and 21. The results from the t-test are in Table 58.

Table 58

*Group Differences between Gender and Survey Question*

Question	Male		Female		df	T
	M	SD	M	SD		
1	2.24	1.119	2.41	1.095	72	-.666
2	2.48	1.004	2.95	.999	72	-1.992
3	2.00	1.000	2.63	.859	72	-2.934*
4	2.58	1.062	2.22	.962	72	1.512
5	3.55	1.175	3.41	1.284	72	.452
6	2.64	1.365	2.27	.975	72	1.351
7	3.82	1.211	3.80	1.077	72	.050
8	2.55	1.092	2.17	.892	72	1.625
9	3.09	1.128	3.37	1.090	72	-1.062
10	3.15	1.004	3.54	1.075	72	-1.578
11	2.91	1.100	2.44	.923	72	1.999*

12	1.70	.770	2.02	.758	72	-1.834
13	1.94	.998	2.56	.923	72	-2.777*
14	1.45	.794	1.88	.927	72	-2.080*
15	4.24	1.173	3.98	1.012	72	1.050
16	4.55	.666	4.29	.782	72	1.475
17	1.79	.650	2.07	.818	72	-1.631
18	2.12	.992	2.61	1.070	72	-2.016*
19	1.52	.619	1.90	.768	72	-2.347*
20	4.33	.957	3.61	1.282	72	2.692*
21	3.06	1.197	2.22	1.235	72	2.952*
22	3.18	1.286	2.73	1.205	72	1.550

\*  $p < .05$

An independent sample t-test was carried out between gender and each survey question. The test revealed that there was a statistically significant difference for question 3 which addressed safety,  $t(74) = (-2.934)$ ,  $p < .05$  ( $p = .004$ ). The mean for males ( $M = 2.00$ ,  $SD = 1.00$ ) was lower than the mean for females ( $M = 2.63$ ,  $SD = .859$ ). The effect size,  $d$ , was computed to be .327, which is a weak effect size. The results from the t-test are shown in Table 58.

The test also revealed that there was a statistically significant difference for question 11 which addressed cleanliness,  $t(74) = (1.999)$ ,  $p < .05$  ( $p = .049$ ). The mean for males ( $M = 2.91$ ,  $SD = 1.100$ ) was higher than the mean for females ( $M = 2.44$ ,  $SD = .923$ ). The effect size,  $d$ , was computed to be .229, which is a weak effect size. The results from the t-test are shown in Table 58.

The test also revealed that there was a statistically significant difference for question 13 which addressed satisfaction level during the renovation,  $t(74) = (-2.777)$ ,  $p < .05$  ( $p = .007$ ). The mean for males ( $M = 1.94$ ,  $SD = .998$ ) was lower than the mean for females ( $M = 2.56$ ,  $SD = .923$ ). The effect size,  $d$ , was computed to be .311, which is a weak effect size. The results from the t-test are shown in Table 58.

The test also revealed that there was a statistically significant difference for question 14 which addressed satisfaction level since the completion of the renovation,  $t(74) = (-2.080)$ ,  $p < .05$  ( $p = .041$ ). The mean for males ( $M = 1.45$ ,  $SD = .794$ ) was lower than the mean for females ( $M = 1.88$ ,  $SD = .927$ ). The effect size,  $d$ , was computed to be .238, which is a weak effect size. The results from the t-test are shown in Table 58.

The test also revealed that there was a statistically significant difference for question 18 which rated the school as a good place to work during the renovation,  $t(74) = (-2.016)$ ,  $p < .05$  ( $p = .047$ ). The mean for males ( $M = 2.12$ ,  $SD = .992$ ) was lower than the mean for females ( $M = 2.61$ ,  $SD = 1.070$ ). The effect size,  $d$ , was computed to be .231, which is a weak effect size. The results from the t-test are shown in Table 58.

The test also revealed that there was a statistically significant difference for question 19 which rated the school as a good place to work after the renovation,  $t(74) = (-2.347)$ ,  $p < .05$  ( $p = .022$ ). The mean for males ( $M = 1.52$ ,  $SD = .619$ ) was lower than the mean for females ( $M = 1.90$ ,  $SD = .768$ ). The effect size,  $d$ , was computed to be .267, which is a weak effect size. The results from the t-test are shown in Table 58.

The test also revealed that there was a statistically significant difference for question 20 regarding difficulties directly caused by construction workers,  $t(74) = (2.692)$ ,  $p < .05$  ( $p = .009$ ). The mean for males ( $M = 4.33$ ,  $SD = .957$ ) was higher than the mean for females ( $M = 3.61$ ,  $SD$

= 1.282). The effect size,  $d$ , was computed to be .302, which is a weak effect size. The results from the t-test are shown in Table 58.

The test also revealed that there was a statistically significant difference for question 21 which addressed satisfaction level and room temperature,  $t(74) = (2.952)$ ,  $p < .05$  ( $p = .004$ ). The mean for males ( $M = 3.06$ ,  $SD = 1.197$ ) was higher than the mean for females ( $M = 2.22$ ,  $SD = 1.235$ ). The effect size,  $d$ , was computed to be .329, which is a weak effect size. The results from the t-test are shown in Table 58.

**Age category and survey questions.** An Analysis of Variance (ANOVA) test was conducted for each age category on each survey question. The ANOVA is a global test of differences looking for significant differences between means. The between groups within the ANOVA was significant at the  $p < .05$  level for only question 14. A Bonferroni post hoc analysis was then conducted to find the individual means and if significance existed. Question 14 which addressed job satisfaction since the renovation project was found to have significance within the categories. The 21-25 Age Category was comprised of three males and six females while the 26-35 Age Category had eight males and 10 females. The results are shown in Table 59 and Table 60.

Table 59

*Summary of 1 x 5 ANOVA for Age Category and Survey Question 14*

Source	Sum of Squares	df	Mean Square	$F$	Effect Size
Between Groups	9.056	4	.606	3.201*	.157
Within Groups	48.795	69	.707		
Total	57.851	73			

\*  $p < .05$

Table 60

*Bonferroni Comparison for Age Category and Survey Question 14*

Comparisons	Mean Difference	Std. Error	95% Confidence Interval for Mean	
			Lower Bound	Upper Bound
21-25 vs.26-35	-1.111*	.343	-2.11	-.12
21-25 vs.36-45	-.639	.371	-1.71	.44
21-25 vs.46-55	-.389	.329	-1.34	.56
21-25 vs.56 or Older	-.525	.378	-1.62	.57
26-35 vs.36-45	.472	.313	-.44	1.38
26-35 vs.46-55	.722	.262	-.04	1.48
26-35 vs.56 or Older	.586	.322	-.35	1.52
36-45 vs.46-55	.250	.297	-.61	1.11
36-45 vs.56 or Older	.114	.351	-.90	1.13
46-55 vs.56 or Older	-.136	.306	-1.02	.75

\*  $p < .05$

These tests were completed to see if there was a difference in age category and survey question 14. The total population consisted of 74 surveys with 9 (12%) in the 21 – 25 Age Category, 18 (24%) in the 26 – 35 Age Category, 12 (16%) in the 36 – 45 Age Category, 24 (32%) in the 46 – 55 Age Category, and 11 (15%) in the 56 or Older Age Category.

An alpha level of 0.05 was used for all statistical tests and  $d$  was calculated as the effect size. A 1 x 5 analysis of variance (ANOVA) was calculated on age category and question 14. The analysis was significant,  $F(4, 69) = 3.201$ ,  $p < .05$  ( $p = .018$ ). The effect size,  $d = .157$ , shows the relationship was weak. Post hoc analyses using the Bonferroni post hoc criterion for

significance indicated that the 21 – 25 Age Category ( $M = 1.11$ ,  $SD = .333$ ) was significantly different in question 14 with the 26-35 Age Category ( $M = 2.22$ ,  $SD = 1.396$ ).

***Number of classroom moves and survey questions.*** An Analysis of Variance (ANOVA) test was conducted for the number of moves on each survey question. The between groups within the ANOVA was not significant at the  $p < .05$  level for any of the questions. The significance levels for classroom moves and each survey question are shown in Table 61.

Table 61

*Significance Levels for Classroom Moves and Survey Question*

Question	Significance
1	.361
2	.914
3	.140
4	.798
5	.914
6	.503
7	.311
8	.497
9	.448
10	.440
11	.601
12	.330
13	.975
14	.280
15	.516
16	.458
17	.637
18	.707
19	.223
20	.411
21	.637
22	.692

***Subject area taught and survey questions.*** An Analysis of Variance (ANOVA) test was conducted for the subject area taught on each survey question. The between groups within the

ANOVA was not significant at the  $p < .05$  level for any of the questions. The significance levels for subject area taught and each survey question are shown in Table 62.

Table 62

*Significance Levels for Subject Area Taught and each Survey Question*

Question	Significance
1	.386
2	.528
3	.625
4	.968
5	.089
6	.591
7	.849
8	.227
9	.892
10	.522
11	.645
12	.243
13	.980
14	.825
15	.244
16	.640
17	.567
18	.660
19	.120
20	.843
21	.204
22	.336

***Years of teaching experience and survey questions.*** An Analysis of Variance (ANOVA) test was conducted for years of experience on each survey question. The between groups within the ANOVA was not significant at the  $p < .05$  level for any of the questions. The significance levels for years of teaching experience and each survey question are shown in Table 63.

Table 63

*Significance Levels for Years of Teaching Experience and each Survey Question*

Question	Significance
1	.589
2	.480
3	.963
4	.063
5	.519
6	.232
7	.526
8	.423
9	.415
10	.191
11	.300
12	.362
13	.721
14	.291
15	.707
16	.891
17	.090
18	.620
19	.252
20	.897
21	.350
22	.536

### Responses to Open Ended Questions

The researcher tallied the main themes from the two open ended survey questions. A summary of these findings are presented. The information is added to provide ideas for future research and to give a voice to the participants regarding situations that may not have been addressed in the survey questions 1 through 22.

The participants were asked to describe a difficult experience that occurred due to the renovation project and a recommendation of how it could have been successfully handled in question 23 (See Table 64). If the participant did not have a difficult experience, a response of “none” was requested to be written. Twenty-six of the 74 participants (35%) responded with “none” for question 23. The next highest theme included communication where 12 participants (16%) listed this as a major concern. The temperature in the building ranked third, cited nine

times (12%), and the dirt/dust ranked fourth being cited eight times (11%). Lack of space was cited six times (8%) and noise levels were cited five times (7%). Two participants (3%) included construction workers and two participants (3%) listed odor as a difficult experiences.

Table 64

*Frequency of Open Ended Responses*

Response	N	%
None	26	35
Communication	12	16
Temperature	9	12
Dirt / Dust	8	11
Space, lack of / sharing	6	8
Noise Level	5	7
Construction Worker	2	3
Odor	2	3
Total of 74 Participants	70	95

Most of the difficult experiences listed as a response to question 23 did not have a recommendation. Of the responses that included a recommendation, the most prevalent suggestion was communication. The participants felt as if communication could have avoided or solved the difficult situation.

The participants were asked to include any interesting or unique experiences that happened to him or her or during their class in question 24. One teacher wrote that it all became funny after a few months and another saw a drill come through the wall as he was teaching. One teacher broke her foot stepping in a hole while another said water leaks caused teaching supplies to get discarded creating an immediate change in lesson plans. Three teachers said the

renovation project was relevant to their subject and used it as a teaching aid for their curriculum. Six teachers stated that the project forced everyone to be flexible which caused a stronger bond between the teachers and between the teachers and students. One student told a teacher that it was cool walking through the temporary door in the hallway to enter the newly completed part of the building as if he was walking from a warehouse through a time warp into the new addition.

## Chapter 5

### Introduction

This chapter summarizes the research, presents the findings, discusses the conclusions based on the data analysis in Chapter 4, and presents implications for practitioners for renovation projects. Several conclusions are drawn from the results while a lack of differences is also presented. Recommendations for future research are presented as closure to this chapter. With a return rate of 97.4%, the analysis of the survey responses enabled the researcher to report differences in teacher perception of satisfaction, differences between the two schools, and differences among the demographic variables. The differences were minimal in number but are distinct and can be used by school leaders in Augusta County, Virginia during the next renovation project.

### Summary of Major Findings

**Finding #1.** Overall teacher satisfaction was minimally affected by the renovation project. The data analysis found 4% (3) of the teachers were dissatisfied, 60% (44) were neutral, and 36% (27) were satisfied. This finding was not consistent with other studies (Cash & Twiford, 2009; Dawson & Parker, 1998) that stated overall teacher satisfaction can be affected by a renovation project. The number of teachers coded as neutral was higher than the researcher expected as shown in Table 51. The findings from this study may be more neutral due to the ambivalence by the teachers towards the renovation project, the amount of time between the end of the project and the collection of data, or the fact that the researcher was also a principal at one of the schools. There is no way to accurately discern this finding as to why the majority of the teachers had more neutral perceptions.

Seven out of 22 survey questions (32%) had a mean score between 2.50 and 3.49 which corresponds with a feeling of neutral by the teachers. Although the means for these survey questions resulted in a neutral code, the highest percentage for individual responses (mode) for each question did not correspond with a response of neutral. The seven survey questions had a mode in the individual response results for agree or disagree. Therefore, the mode for the data for these seven questions did not have neutral responses while the mean was neutral.

The survey questions were:

- #2 – I felt that the renovation project caused me to spend more time than normal preparing to teach my class.
- #5 – The availability and use of technology in my classroom was not affected by the renovation project.
- #9 – Overall, I felt that my teaching satisfaction was not affected in any way by the renovation project.
- #10 – I felt that the overall teacher morale remained the same during the project.
- #11 – The cleanliness of the school negatively affected my satisfaction as a teacher.
- #21 – My satisfaction was negatively affected by my room temperature during the renovation project.
- #22 – Odors caused by the renovation project negatively affected my satisfaction.

**Finding #2.** Areas of dissatisfaction include cleanliness of the school, teachers seeking a transfer to avoid another renovation project, teachers considering relocation during the project, and room temperature having an effect on satisfaction. A one-way ANOVA revealed 20 of the 22 likert scale questions had a significant relationship between at least two of the satisfaction codes. The two questions that did not have significance were question 1: Sufficient time was provided for me to be prepared as a teacher for each phase of the project and question 5: The availability and use of technology in my classroom was not affected by the renovation project.

A Bonferonni post hoc analysis revealed 15 survey questions had significance between the code of satisfaction and the code of dissatisfaction. The survey questions that had significance were: 2, 3, 9, 10, 11, 13, 14, 15, 16, 17, 18, 19, 20, 21, and 22. The effect size for

these results were weak except for survey questions 9, 11, 15, 16, and 21 which had moderate effect sizes (3.49 - 7.49) as shown in Tables 23, 27, 35, 37, and 47 respectively. The five survey questions were:

- #9 - Overall, I felt that my teaching satisfaction was not affected in any way by the renovation project.
- #11 – The cleanliness of the school negatively affected my satisfaction as a teacher.
- #15 – If another renovation project were to occur at your school, would you seek a transfer to another school?
- #16 – During the renovation project, I considered relocating to another school due to the renovation project.
- #21 – My satisfaction was negatively affected by my room temperature during the renovation project.

These findings were consistent with other studies. Cleanliness and academic achievement and behavior were found to have a relationship in the study by Cash (1993) and the review of research by Earthman and Lemasters (1998). Schneider (2003) and Young (2003) found a relationship between cleanliness and satisfaction consistent with this study. A teacher who would pursue a transfer to avoid another renovation project or considered relocating during the project was consistent with the findings in the Schneider (2003) study. Room temperature had an effect on the teachers in the building is consistent with the studies of Cash (1993), Dawson and Parker (1998), Earthman (2002), Schneider (2003), and the review of studies by Earthman and Lemasters (1996, 1998) which found room temperature affected student achievement and behavior. These studies or reviews did not discuss any relationship with teacher satisfaction but did find these factors had an influence within a school building.

**Finding #3.** A difference in teacher satisfaction between the two schools was found. Overall teacher satisfaction was higher at SDHS (47%) compared to WMHS (28%) while the majority of the teachers at WMHS were classified as neutral (70%). Overall teacher dissatisfaction was not found to be different between the schools. Only three participants were

classified as dissatisfied with SDHS having two participants and WMHS having one. Previous studies were not found that support or contradict this finding.

**Finding #4.** Differences in teacher satisfaction between the two schools regarding safety and odor were found. The independent sample t-test for each survey question between the two schools revealed two survey questions having a relationship that was significant. Question 3: I felt safe during the renovation project found the mean for SDHS to be 1.94 and WMHS as 2.70. The scores would correlate to SDHS participants feeling safe while the WMHS participants felt more neutral. This finding is consistent with the studies by Tuttle (2002) and Young (2003) and a principal's guide written by Earthman and Draeger (2000) that the perception of feeling safe is related to the condition of the building. These studies did not discuss any relationship with teacher satisfaction but did find the perception of feeling safe was an influencing factor within a school building. Question 22: Odors caused by the renovation project negatively affected my satisfaction found the mean for SDHS to be 3.41 and WMHS as 2.52. The teachers at SDHS felt that they were not affected by odor while WMHS teachers felt more neutral. This finding is similar to the study by Young (2003) where odor was found to directly or indirectly affect student learning. Young does not discuss teacher satisfaction but did find that odor was an influencing factor within a school building.

**Finding #5.** No significance between the two schools was found when analyzing satisfaction code, age category, gender, number of classroom moves, subject area taught by the teacher, or years of teaching experience. A lack of significance found no need for further investigation on these variables between the two schools.

**Finding #6.** Differences in teacher satisfaction were found when analyzed by gender. The independent t-test for gender and each survey question revealed eight questions had

significance. Overall, both males and females felt satisfied but the females were less satisfied regarding questions of safety, cleanliness, job satisfaction during and after the renovation project, school rating during and after the renovation project, difficulty with construction workers, and negative effects of room temperature. Previous studies (Earthman, 1998a, 2002, Schneider, 2003, Tuttle, 2002, Young, 2003), a review of studies by Earthman and Lemasters (1996, 1998), and a guide for principals written by Earthman and Draeger (2000) have found that these factors do affect student achievement levels and overall satisfaction but the studies did not include data related to gender.

**Finding #7.** Teacher satisfaction among the 21-25 age group was significantly higher than the 26-35 age group. The results from the one-way ANOVA test for age category and each survey question found only question 14 had significance. Question 14: Since the completion of the renovation project, I have been satisfied with my job had a mean score of 1.11 for the 21 – 25 age category compared to a mean score of 2.22 for the 26 – 35 age category. The younger teachers strongly agreed about their job satisfaction as compared to the next age category, 26 – 35, only agreeing with their job satisfaction. No other age category had significant mean differences. Past research (Schneider, 2003) found building conditions to have a relationship with a teacher's decision to remain in the occupation but the data did not include any relationships specific to age or any age category.

**Finding #8.** The number of moves, subject area taught, and years of experience had no significant impact on teacher satisfaction. Previous studies were not found that support or contradict these findings.

## Conclusion

The purpose of this study was to investigate and report the perceptions of teachers during a renovation project. Although the analyzed data found relationships, the number of relationships was fewer than expected by the researcher. The number of open ended responses of “none” from the survey question about difficult experiences was 35%. Only three participants were coded with a dissatisfying perception. These two pieces of data denote a small amount of teacher dissatisfaction. The overall perception of the teachers during the renovation project was one of neutral.

The researcher expected to find a larger amount of dissatisfaction related to the renovation project. The overwhelming amount of neutral findings may be attributed to several factors. The collection of data occurred 10 months after the completion of the renovation project. Teachers’ perceptions and their memory of those perceptions may have been lost due to the time lapse. However, the findings from the more extreme ends of the satisfied or dissatisfied scale would be more powerful due to this time constraint. The three teachers who were dissatisfied felt strongly enough about their perceptions to have them last for a 10 month period but having only three dissatisfied teachers does not make a strong case for a finding.

The amount of neutral responses may be attributed to the belief that the teachers were ambivalent to the renovation project. The teachers may have felt that the situations during the project were to be expected and therefore were not seen as positive or negative situations. The third factor that may have led to more neutral responses was the fact that the researcher was also the principal at one of the schools where data was collected. The teachers at this school (70% neutral) may have consciously or subconsciously answered the questions according to what they

thought the principal wanted or felt uncomfortable rating a situation more towards one of the extreme ends of the likert scale.

Only five of the survey questions had an observed difference at a medium effect level. Satisfied and dissatisfied teachers differed in overall satisfaction, cleanliness, seeking a transfer to avoid a renovation project, thoughts of relocating during the project, and room temperature.

Only two issues were determined to be different between the two schools: safety and odor. The teachers at SDHS indicated feeling safer than those at WMHS but it is important to clarify that neither of the teaching staffs felt unsafe. The teachers at both schools responded differently in regards to odor as well. The teachers at SDHS did not feel that they were negatively affected by odor and WMHS teachers were neutral. Again, it is important to clarify the data showed neither school was dissatisfied with odor which was present at both schools periodically.

The demographic variable analysis found gender and age category having significant differences. Females were less satisfied with the issues of safety, cleanliness, overall job satisfaction during and after the renovation project, rating of the school as a good place to work, difficulty with construction workers, and room temperature. It is important to clarify both males and females felt safe, were satisfied with cleanliness, were satisfied during and after the renovation project, rated the school as a good place to work, did not experience difficulties related to construction workers, and were not negatively affected by room temperature. Only their levels of satisfaction were different.

Previous research has found that building conditions affect students, teachers, and achievement levels. This study found a neutral experience by the teachers relating to building conditions and their level of satisfaction. A minimal amount of dissatisfaction could be

attributed to the lack of memory by the teachers due to the time lapse in data collection, a feeling of ambivalence towards the project, flexibility of the teachers to adapt, the personality of the teachers, the renovation process and planning, the leadership provided during this project by construction and school leaders, or a combination of all of these.

### **Implications for Practitioners**

Based on the findings of this study, there is a need to initiate proactive steps regarding gender differences. Awareness by school leaders of variances in gender sensitivity regarding safety, odor, cleanliness, temperature, and interaction with construction workers could lessen the number of negative situations and positively increase teacher satisfaction. Although this study only included staff from two schools set in a rural location, the findings could be used in any renovation project. Communication on these five issues and how to address them by school and construction leaders is essential. Doctoral programs and principal preparation programs need to include information regarding the leadership role during a renovation project and how decisions may affect teacher satisfaction.

### **Recommendations for Further Research**

The number of findings from this study was fewer than expected. There is a need to evaluate other schools that have been renovated using a qualitative method of analysis on teacher satisfaction and a need to include larger schools as well. Only 74 participants were included in the population for this study and the findings only had three teachers who were coded as dissatisfied. This may not be enough data to make changes based on this study alone.

A broader study including more participants and from other geographical school locations would provide more knowledge towards teacher satisfaction. Different schools with different

construction companies need to be evaluated as well. Research could then be conducted to compare the results of these future studies.

The survey used in this study may need to be improved. The open ended questions included in this study listed a few issues that were not covered in the survey. The participants listed communication as one of the areas that was not covered in the survey. Therefore, additions to this survey or using a more defined survey could add to further research. A survey that did not include a choice of “neutral” on the likert scale would force the participants to respond as satisfied or dissatisfied providing a distinct separation in satisfaction levels. Another recommendation would include collecting data before, during, and after a renovation project using the same survey with the same population. This would provide baseline data that would be used for a comparison.

A qualitative study could be conducted on these same two schools to investigate the results of why the teachers had a majority of neutral responses. Open ended questions could cover the decisions made by the school leaders, instructional leaders, construction company leaders, architectural design leaders, why this phenomenon was perceived as neutral, and why do some of the situations during the renovation project appear to have run smoothly.

Although the findings in this study can be used by school leaders to increase teacher satisfaction during a renovation project, further study of the demographics and renovation situations are necessary to aid those outside of Augusta County, Virginia.

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## Appendix A

### Survey Instrument

TEACHER SURVEY					
School that you were employed during the renovation project? (Fall 2006-Spring 2009) <input type="checkbox"/> SDHS <input type="checkbox"/> WMHS					
Your age during the renovation project? (as of September 1, 2006) <input type="checkbox"/> 21-25 <input type="checkbox"/> 26-35 <input type="checkbox"/> 36-45 <input type="checkbox"/> 46-55 <input type="checkbox"/> over 56 years old					
What is your gender? <input type="checkbox"/> Female <input type="checkbox"/> Male					
How many times was your assigned classroom moved to another location? (Example: moving to one location and then moving back to your original location equals 2 moves) <input type="checkbox"/> 0 moves <input type="checkbox"/> 1 move <input type="checkbox"/> 2 moves <input type="checkbox"/> 3 moves <input type="checkbox"/> 4 moves <input type="checkbox"/> 5 or more moves					
Select the main subject area that you taught during the renovation project. (choose only one) <input type="checkbox"/> Math <input type="checkbox"/> English <input type="checkbox"/> Social Studies <input type="checkbox"/> Science <input type="checkbox"/> Fine Arts <input type="checkbox"/> Other					
How many years of teaching experience did you have before the renovation project started in the Fall of 2006? <input type="checkbox"/> 0-3 <input type="checkbox"/> 4-6 <input type="checkbox"/> 7 or more years					
For each item identified below, circle the number to the right that best fits your level of agreement.					
Description/Identification of Survey Item	<b>1 – Strongly Agree</b> <b>2 – Agree</b> <b>3 – Neutral</b> <b>4 – Disagree</b> <b>5 – Strongly Disagree</b>  Scale				
1. Sufficient time was provided for me to be prepared as a teacher for each phase of the project	1	2	3	4	5
2. I felt that the renovation project caused me to spend more time than normal preparing to teach my class	1	2	3	4	5
3. I felt safe during the renovation project	1	2	3	4	5
4. I did not like the number of disruptions in my class caused by the renovation project	1	2	3	4	5
5. The availability and use of technology in my classroom was not affected by the renovation project	1	2	3	4	5
6. I felt more stress during the project than before or after the project	1	2	3	4	5
7. The learning environment in my room was not affected by the project	1	2	3	4	5
8. The noise level during the renovation project annoyed me	1	2	3	4	5
9. Overall, I felt that my teaching satisfaction was not affected	1	2	3	4	5

in any way by the renovation project					
10. I felt that the overall teacher morale remained the same during the project	1	2	3	4	5
11. The cleanliness of the school negatively affected my satisfaction as a teacher	1	2	3	4	5
12. Before the renovation project, I was satisfied with my job	1	2	3	4	5
13. During the renovation project, I was satisfied with my job	1	2	3	4	5
14. Since the completion of the renovation project, I have been satisfied with my job	1	2	3	4	5
15. If another renovation project were to occur at your school, would you seek a transfer to another school?	1	2	3	4	5
16. During the renovation project, I considered relocating to another school due to the renovation project.	1	2	3	4	5
17. Overall, before the renovation project, I would rate the school as a good place to work	1	2	3	4	5
18. Overall, during the renovation project, I would rate the school as a good place to work	1	2	3	4	5
19. Overall, after the renovation project, I would rate the school as a good place to work	1	2	3	4	5
20. I experienced difficulties that were directly caused by individual construction workers	1	2	3	4	5
21. My satisfaction was negatively affected by my room temperature during the renovation project	1	2	3	4	5
22. Odors caused by the renovation project negatively affected my satisfaction	1	2	3	4	5

23. Describe a difficult experience that occurred due to the renovation project and your recommendation of how it could have been successful. If you did not have a difficult experience, write “none” in the space provided.

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24. What interesting or unique thing happened to me or my class during the renovation?

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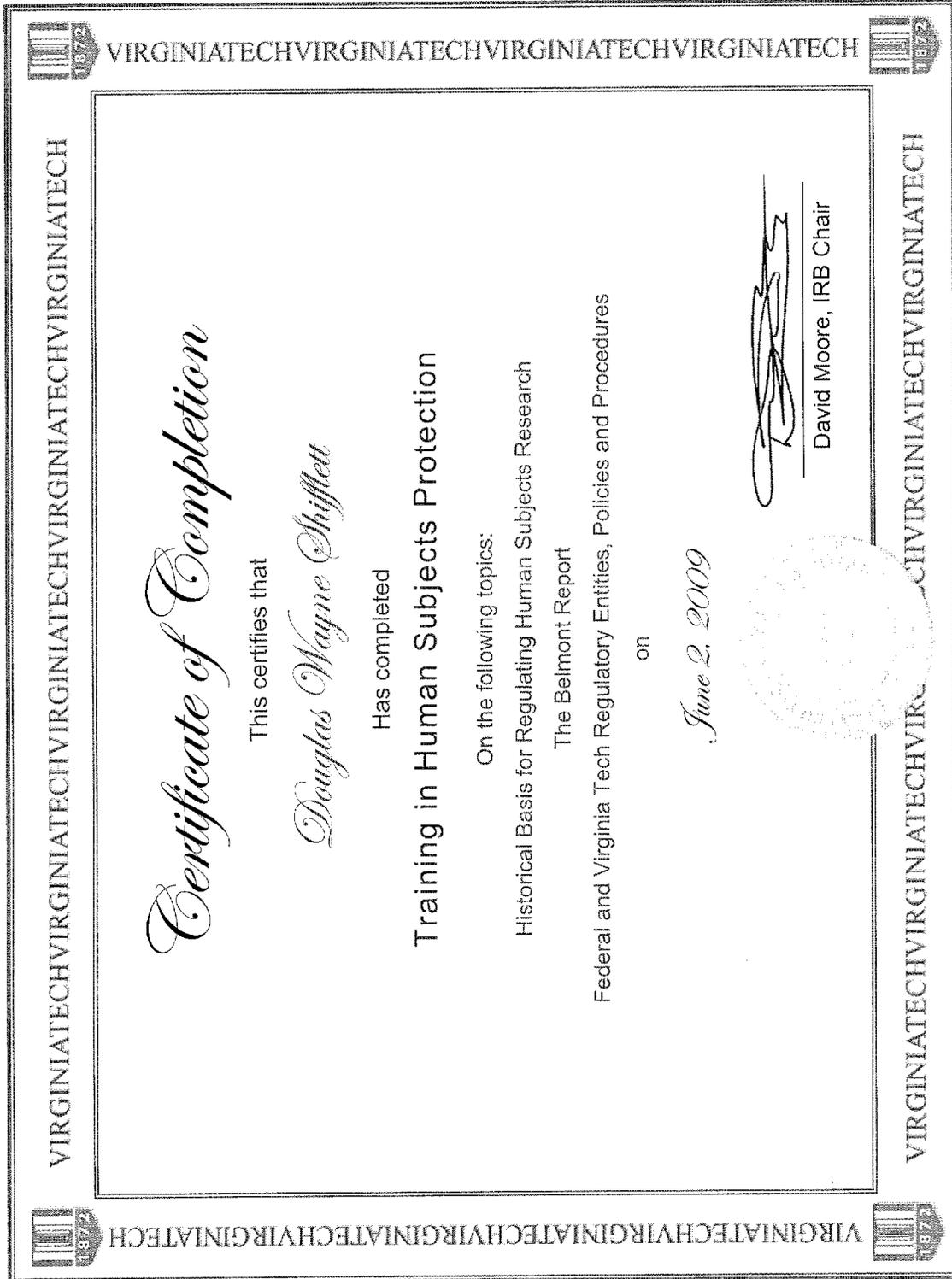
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Appendix B

IRB Certificate of Completion



## Appendix C

### IRB Exempt Approval



**Office of Research Compliance**  
 Institutional Review Board  
 2000 Kraft Drive, Suite 2000 (0497)  
 Blacksburg, Virginia 24061  
 540/231-4991 Fax 540/231-0959  
 e-mail moored@vt.edu  
 www.irb.vt.edu

FWA00000672( expires 1/20/2010)  
 IRB # is IRB00000667

DATE: October 29, 2009

MEMORANDUM

TO: Carol Cash  
 Douglas Shifflett

FROM: David M. Moore 

SUBJECT: **IRB Exempt Approval:** "A Study of Teacher Experiences During a Renovation Project", IRB # 09-905

I have reviewed your request to the IRB for exemption for the above referenced project. The research falls within the exempt status, CFR 46.101(b) category(ies) 2. Approval is granted effective as of October 29, 2009.

As an investigator of human subjects, your responsibilities include the following:

1. Report promptly proposed changes in the research protocol. The proposed changes must not be initiated without IRB review and approval, except where necessary to eliminate apparent immediate hazards to the subjects.
2. Report promptly to the IRB any injuries or other unanticipated or adverse events involving risks or harms to human research subjects or others.

cc: File

*Invent the Future*

**Appendix D**

## Permission Letter to Dr. Gary McQuain

189 Hornet Drive  
Fishersville, VA 22939  
August 20, 2009

Augusta County Public Schools  
6 John Lewis Road  
Fishersville, VA 22939

Dear Dr. McQuain,

As you are aware, I am pursuing a doctoral degree from Virginia Polytechnic Institute and State University in Blacksburg, Virginia. My research will include the teacher experiences during the renovation projects of Wilson Memorial High School and Stuarts Draft High School. I will be using these findings to aid school leaders in the management of their faculty during renovation projects in the future.

This letter is requesting your permission to use a survey instrument created by me to gather data from the teaching faculty of Wilson Memorial High School and Stuarts Draft High School. The survey is enclosed. I am also requesting permission to include the name of the county and schools within the document.

I thank you in advance for your consideration of these requests. I have enclosed a permission letter for your signature. If you have any questions, you may reach me at 886-4286 or by email at [dwshiffl@augusta.k12.va.us](mailto:dwshiffl@augusta.k12.va.us).

Sincerely,

Douglas W. Shifflett, Jr.  
Principal

Enclosures (1)

**Appendix E**

## Permission Letter to Principal

189 Hornet Drive  
Fishersville, VA 22939  
August 20, 2009

Stuarts Draft High School  
1028 Augusta Farms Road  
Stuarts Draft, VA 24477

Dear Mrs. Abernathy,

As you are aware, I am pursuing a doctoral degree from Virginia Polytechnic Institute and State University in Blacksburg, Virginia. My research will include the teacher experiences during the renovation projects of Wilson Memorial High School and Stuarts Draft High School. I will be using these findings to aid school leaders in the management of their faculty during renovation projects in the future.

This letter is requesting your permission to use a survey instrument created by me to gather data from the teaching faculty of Stuarts Draft High School during the teacher workday in October of 2009. The survey is enclosed.

I thank you in advance for your consideration of this request. I have enclosed a permission letter for your signature. If you have any questions, you may reach me at 886-4286 or by email at [dwshiffl@augusta.k12.va.us](mailto:dwshiffl@augusta.k12.va.us).

Sincerely,

Douglas W. Shifflett, Jr.  
Principal

Enclosures (1)

**Appendix F**

## Information Letter to Teacher

189 Hornet Drive  
Fishersville, VA 22939  
September 20, 2009

Dear Faculty Member,

As you may be aware, I am pursuing a doctoral degree from Virginia Polytechnic Institute and State University in Blacksburg, Virginia. My research will include the teacher experiences during the renovation projects of Wilson Memorial High School and Stuarts Draft High School. I will be using these findings to aid school leaders in the management of their faculty during renovation projects in the future.

Attachment to this letter includes: purpose of the project, procedures for administering the survey, risks, benefits, anonymity and confidentiality, compensation, freedom to withdraw, subject's responsibilities, and subject's permission.

I thank you in advance for your participation in this endeavor.

Sincerely,

Douglas W. Shifflett, Jr.  
Principal

Attachment: Informed Consent Form

## Informed Consent Form

### **VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY**

Informed Consent for Participants  
in Research Projects Involving Human Subjects

Title of Project: A Study of Teacher Experiences During a Renovation Project

Investigator: Douglas W. Shifflett, Jr.

#### **I. Purpose of this Research/Project**

The purpose of this research is to document and examine the perceptions of teachers during a renovation project. Common factors will be identified. Common recommendations and experiences of teachers will be included in the dissertation. This research will be used for the completion of my dissertation.

#### **II. Procedures**

You will be given a survey questionnaire to complete. You are asked to be honest regarding your perceptions and experiences during the renovation project. You will only have to fill out one survey and there are no other requests from the investigator.

#### **III. Risks**

As with any study, there are minimal risks associated in your participation. Risks may range from physical danger while completing the survey exercise to emotional distress caused by remembering unpleasant experiences. You may skip a question that you do not wish to answer.

#### **IV. Benefits**

School leaders will benefit from the information that you provide which could develop programs and strategies to help teachers be successful during future renovation projects.

No promise or guarantees of benefits have been made to encourage your participation. You may contact the researcher at a later time for a summary of the research results.

## **V. Extent of Anonymity and Confidentiality**

Anonymity is provided for the participant through the collection of data procedures. Names or identification numbers will not be included in the survey. Only a checklist of who has completed a survey will be created. Participants and their survey will not be linked in any manner by the researcher. However, some of the demographic data and the essay question may be identifiable due to the wording and content of the particular experience included in the essay question. Participants will not be identified in any written document resulting from the collected data or the findings from this study.

It is possible that the Institutional Review Board (IRB) may view this study's collected data for auditing purposes. The IRB is responsible for the oversight of the protection of human subjects involved in research.

In some situations, it may be necessary for an investigator to break confidentiality. If child abuse is known or strongly suspected from the collected data, I am required to notify the appropriate authorities. If a participant is believed to be a threat to herself/himself or others, I will notify the appropriate authorities.

## **VI. Compensation**

There is no compensation given to you for participation in this study.

## **VII. Freedom to Withdraw**

You are free to withdraw from the study at any time. You may skip any question and not provide an answer but continue with the study. There may be circumstances under which the investigator may determine that a participant should not continue as a subject.

## **VIII. Subject's Responsibilities**

I voluntarily agree to participate in this study.

I have the following responsibility: I agree to answer the questions honestly.

## **IX. Subject's Permission**

I have read the Consent Form and conditions of this project. I have had all my questions answered. I hereby acknowledge the above and give my voluntary consent:

\_\_\_\_\_ Date \_\_\_\_\_  
Subject signature

Should I have any pertinent questions about this research or its conduct, and research subjects' rights, and whom to contact in the event of a research-related injury to the subject, I may contact:

Douglas W. Shifflett, Jr. [540-886-4286](tel:540-886-4286)/[dwshiffl@augusta.k12.va.us](mailto:dwshiffl@augusta.k12.va.us)  
Investigator

Dr. Carol S. Cash [ccash48@vt.edu](mailto:ccash48@vt.edu)  
Faculty Advisor

Dr. Travis W. Twiford [ttwiford@vt.edu](mailto:ttwiford@vt.edu)  
Departmental Head

David M. Moore [540-231-4991](tel:540-231-4991)/[moored@vt.edu](mailto:moored@vt.edu)  
Chair, Virginia Tech Institutional Review  
Board for the Protection of Human Subjects  
Office of Research Compliance  
1880 Pratt Drive, Suite 2006 (0497)

[NOTE: Subjects must be given a complete copy (or duplicate original) of the signed Informed Consent.]

## Appendix G

### Survey Demographic Data

survey number	school	age category	gender	number of moves	subject area	teaching experience
1	W	21	F	2	E	7
2	W	36	F	1	M	7
3	W	26	F	1	M	7
4	W	26	F	2	O	7
5	W	36	M	5	O	7
6	W	36	F	4	O	7
7	W	46	F	1	O	7
8	W	46	M	2	M	0
9	W	46	F	1	E	7
10	W	56	F	0	O	7
11	W	26	M	3	SS	7
12	W	26	M	2	O	4
13	W	26	M	2	O	7
14	W	21	F	0	M	0
15	W	21	F	2	F	0
16	W	21	M	5	O	0
17	W	46	F	2	O	7
18	W	46	M	3	O	7
19	W	46	F	3	O	7
20	W	26	F	2	S	7
21	W	56	F	4	O	7
22	W	36	M	2	S	7
23	W	36	F	2	M	7
24	W	26	F	2	SS	4
25	W	21	N	1	O	0
26	W	46	F	4	O	7
27	W	36	M	2	SS	7
28	W	46	M	2	S	7
29	W	46	F	0	F	7
30	W	46	F	2	E	7
31	W	56	M	2	E	7
32	W	21	M	2	E	0
33	W	46	M	5	O	4
34	W	46	F	2	E	7
35	W	46	F	3	O	0

36	W	36	M	2	SS	7
37	W	56	M	4	O	7
38	W	46	F	2	M	7
39	W	46	F	2	O	4
40	W	56	M	2	S	7
41	S	21	F	1	O	0
42	S	26	F	0	S	7
43	S	46	M	4	O	7
44	S	46	M	0	O	7
45	S	26	M	2	E	0
46	S	46	M	0	O	7
47	S	36	F	1	O	4
48	S	56	F	2	M	7
49	S	26	F	2	M	7
50	S	36	F	5	M	7
51	S	26	F	2	E	7
52	S	46	M	2	S	7
53	S	26	M	2	O	4
54	S	46	M	3	E	7
55	S	26	F	1	F	4
56	S	21	F	3	S	0
57	S	56	F	4	O	7
58	S	26	F	1	O	7
59	S	46	F	2	F	7
60	S	26	M	4	SS	7
61	S	56	M	2	S	7
62	S	46	F	2	M	7
63	S	36	M	1	O	7
64	S	26	F	4	O	0
65	S	46	M	2	S	7
66	S	56	F	1	O	7
67	S	21	F	5	F	0
68	S	26	M	3	SS	7
69	S	26	M	5	SS	4
70	S	46	M	5	F	7
71	S	36	F	5	O	7
72	S	56	F	2	M	7
73	S	36	M	3	O	7
74	S	56	M	5	O	7

## Appendix H

### Questionnaire Responses

Question	Response	Frequency	%	M	SD
<b>Question 1</b> Sufficient time for each phase	1 Strongly Agree	16	21.6	2.34	1.101
	2 Agree	35	47.3		
	3 Neutral	7	9.5		
	4 Disagree	14	18.9		
	5 Strongly Disagree	2	2.7		
<b>Question 2</b> More time preparing to teach	1 Strongly Agree	6	8.1	2.74	1.021
	2 Agree	31	41.9		
	3 Neutral	14	18.9		
	4 Disagree	22	29.7		
	5 Strongly Disagree	1	1.4		
<b>Question 3</b> I felt safe	1 Strongly Agree	15	20.3	2.35	.971
	2 Agree	28	37.8		
	3 Neutral	22	29.7		
	4 Disagree	8	10.8		
	5 Strongly Disagree	1	1.4		
<b>Question 4</b> Did not like number of disruptions	1 Strongly Agree	15	20.3	2.38	1.016
	2 Agree	29	39.2		
	3 Neutral	18	24.3		
	4 Disagree	11	14.9		
	5 Strongly Disagree	1	1.4		
<b>Question 5</b> Technology was not affected	1 Strongly Agree	4	5.4	3.47	1.230
	2 Agree	18	24.3		
	3 Neutral	7	9.5		
	4 Disagree	29	39.2		
	5 Strongly Disagree	16	21.6		
<b>Question 6</b> I felt more stress	1 Strongly Agree	18	24.3	2.43	1.171
	2 Agree	24	32.4		
	3 Neutral	19	25.7		
	4 Disagree	8	10.8		
	5 Strongly Disagree	5	6.8		
<b>Question 7</b> Learning environment was not	1 Strongly Agree	2	2.7	3.81	1.131
	2 Agree	14	18.9		
	3 Neutral	1	1.4		
	4 Disagree	36	48.6		

affected	5	Strongly Disagree	21	28.4		
<b>Question 8</b>	1	Strongly Agree	13	17.6	2.34	.997
Noise level	2	Agree	37	50.0		
annoyed me	3	Neutral	11	14.9		
	4	Disagree	12	16.2		
	5	Strongly Disagree	1	1.4		
<b>Question 9</b>	1	Strongly Agree	3	4.1	3.24	1.108
Overall, my	2	Agree	21	28.4		
satisfaction	3	Neutral	13	17.6		
was not	4	Disagree	29	39.2		
affected	5	Strongly Disagree	8	10.8		
<b>Question 10</b>	1	Strongly Agree	1	1.4	3.36	1.054
Overall	2	Agree	20	27.0		
teacher	3	Neutral	13	17.6		
morale	4	Disagree	31	41.9		
remained the same	5	Strongly Disagree	9	12.2		
<b>Question 11</b>	1	Strongly Agree	10	13.5	2.65	1.026
Cleanliness	2	Agree	24	32.4		
negatively	3	Neutral	24	32.4		
affected my	4	Disagree	14	18.9		
satisfaction	5	Strongly Disagree	2	2.7		
<b>Question 12</b>	1	Strongly Agree	24	32.4	1.88	.776
Before	2	Agree	38	51.4		
project, I was	3	Neutral	9	12.2		
satisfied with	4	Disagree	3	4.1		
my job	5	Strongly Disagree	0	0.0		
<b>Question 13</b>	1	Strongly Agree	15	20.3	2.28	1.000
During the	2	Agree	35	47.3		
project, I was	3	Neutral	14	18.9		
satisfied with	4	Disagree	8	10.8		
my job	5	Strongly Disagree	2	2.7		
<b>Question 14</b>	1	Strongly Agree	37	50.0	1.69	.890
Since the	2	Agree	29	39.2		
project, I am	3	Neutral	3	4.1		
satisfied with	4	Disagree	4	5.4		
my job	5	Strongly Disagree	1	1.4		
<b>Question 15</b>	1	Strongly Agree	4	5.4	4.09	1.088
I would	2	Agree	2	2.7		
transfer to	3	Neutral	10	13.5		

avoid another renovation	4	Disagree	25	33.8		
	5	Strongly Disagree	33	44.6		
<b>Question 16</b> During the project, I considered relocating	1	Strongly Agree	1	1.4	4.41	.739
	2	Agree	0	0.0		
	3	Neutral	5	6.8		
	4	Disagree	30	40.5		
	5	Strongly Disagree	38	51.4		
<b>Question 17</b> Before project, the school was a good place to work	1	Strongly Agree	18	24.3	1.95	.757
	2	Agree	46	62.2		
	3	Neutral	7	9.5		
	4	Disagree	2	2.7		
	5	Strongly Disagree	1	1.4		
<b>Question 18</b> During project, the school was a good place to work	1	Strongly Agree	12	16.2	2.39	1.057
	2	Agree	37	50.0		
	3	Neutral	13	17.6		
	4	Disagree	48	10.8		
	5	Strongly Disagree	4	5.4		
<b>Question 19</b> After project, the school was a good place to work	1	Strongly Agree	29	39.2	1.73	.727
	2	Agree	39	52.7		
	3	Neutral	3	4.1		
	4	Disagree	3	4.1		
	5	Strongly Disagree	0	0.0		
<b>Question 20</b> Construction workers caused difficulties	1	Strongly Agree	4	5.4	3.93	1.197
	2	Agree	8	10.8		
	3	Neutral	7	9.5		
	4	Disagree	25	33.8		
	5	Strongly Disagree	30	40.5		
<b>Question 21</b> Temperature negatively affected my satisfaction	1	Strongly Agree	18	24.3	2.59	1.281
	2	Agree	20	27.0		
	3	Neutral	17	23.0		
	4	Disagree	12	16.2		
	5	Strongly Disagree	7	9.5		
<b>Question 22</b> Odors negatively affected my satisfaction	1	Strongly Agree	11	14.9	2.93	1.253
	2	Agree	19	25.7		
	3	Neutral	16	21.6		
	4	Disagree	20	27.0		
	5	Strongly Disagree	8	10.8		

## Appendix I

### Satisfaction Scores and Codes for each Survey

Survey Number	Survey Score	Survey Code
1	2.550	N
2	3.000	N
3	2.600	N
4	2.700	N
5	2.200	S
6	3.100	N
7	3.350	N
8	3.450	N
9	2.850	N
10	3.300	N
11	3.200	N
12	2.250	S
13	2.950	N
14	3.000	N
15	2.300	S
16	2.800	N
17	2.550	N
18	2.200	S
19	2.800	N
20	4.150	D
21	2.650	N
22	3.050	N
23	2.750	N
24	3.050	N
25	1.750	S
26	2.800	N
27	3.350	N
28	2.850	N
29	2.350	S
30	3.250	N
31	1.550	S
32	2.850	N
33	3.450	N
34	3.200	N
35	2.950	N
36	2.150	S
37	2.100	S
38	2.250	S
39	2.400	S
40	2.600	N
41	2.200	S

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42	2.250	S
43	1.850	S
44	2.500	N
45	3.550	D
46	2.500	N
47	2.100	S
48	2.550	N
49	2.650	N
50	2.450	S
51	2.400	S
52	1.600	S
53	2.000	S
54	1.800	S
55	3.200	N
56	3.150	N
57	3.250	N
58	2.350	S
59	3.650	D
60	2.900	N
61	2.650	N
62	3.000	N
63	2.250	S
64	2.950	N
65	2.550	N
66	3.150	N
67	2.050	S
68	1.550	S
69	2.150	S
70	2.150	S
71	3.050	N
72	3.400	N
73	2.150	S
74	2.950	N
Mean	2.670	
SD	0.5358	

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## Appendix J

## Permission Letter to use Theoretical Model

189 Hornet Drive  
Fishersville, VA 22939  
February 3, 2010

Dear Dr. Carol S. Cash,

As you are aware, I am pursuing a doctoral degree from Virginia Polytechnic Institute and State University in Blacksburg, Virginia. My research will include the teacher experiences during the renovation projects of Wilson Memorial High School and Stuarts Draft High School. I will be using these findings to aid school leaders in the management of their faculty during renovation projects in the future.

This letter is requesting your permission to include a copy of your theoretical model from your dissertation entitled: School Building Condition and Student Achievement and Behavior, (1993).

I thank you in advance for your consideration of this request. I have included a designation for your signature. If you have any questions, you may reach me at 886-4286 or by email at [dwsriff@au Augusta.k12.va.us](mailto:dwsriff@au Augusta.k12.va.us).

Sincerely,



Douglas W. Shifflett, Jr.  
Principal

Permission granted Carol S. Cash 2-15-10  
Signature date