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SCHOOL FACILITY DESIGN: ARE WE ASKING THE RIGHT PEOPLE?

by

Dale C. Jerome

Dissertation

Submitted to the Faculty of

Olivet Nazarene University

School of Graduate and Continuing Studies

in Partial Fulfillment of the Requirements for

the Degree of

Doctor of Education

in

Ethical Leadership

May 2012

SCHOOL FACILITY DESIGN: ARE WE ASKING THE RIGHT PEOPLE?

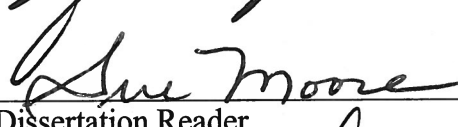
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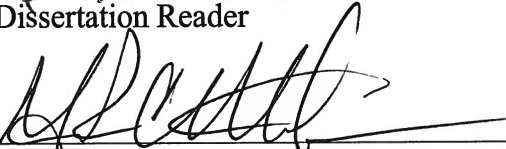
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DEDICATION

I would like to dedicate this dissertation to my wife and family. Thank you for allowing me the time to make this possible. I know this has been a sacrifice for each one of you as well. Thanks for providing your love and support throughout the process.

ABSTRACT

by

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Realizing the need for changes in the design of new school facilities, architects and educators must reach beyond the norms of past designs. This mixed-methods study was conducted at four recently completed high schools. Questionnaires were utilized in the initial phase of research to identify statistically significant differences between the perceptions of teachers and students regarding the physical design characteristics of their learning environment. Structured interview sessions were then conducted with teachers, principals, and architects, to understand their perceptions regarding the involvement of students in the design and planning process of school facilities, and indicated the importance of providing a clear understanding regarding the need for student involvement in the design and planning efforts of 21st-century school facilities.

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CHAPTER I

INTRODUCTION

Sir Winston Churchill (as cited in Churchill, 2003) said, “We shape our buildings, and afterwards our buildings shape us” (p. 358). As an architect who has worked on the design of educational facilities for nearly 20 years, this author has developed an increasing concern for the lack of change in the design of new school facilities. At a time when dramatic changes are occurring in educational delivery, new or remodeled buildings emerge from the design process based on the same factory model developed for schools in the late 1900s.

Billions of dollars are spent each year on school facility improvements. In fiscal year 2007 alone, the capital outlay and interest on debt expenditures by United States public elementary and secondary schools exceeded \$77.6 billion, representing 13.8% of the total school expenditures for the same year (Education Finance Statistics Center [EDFIN], n.d.). How much of the money spent on improving or replacing facilities actually improves learning? “Politicians, school officials, and school designers often proclaim that new schools will raise student achievement, but they’re hard pressed to explain how or why” (Black, 2007, p. 40).

If school designers continue working primarily with school administrators and teachers to gain insight regarding school facilities, is there any certainty that they will produce child-centered solutions? Lack of substantive change in the design of school facilities suggests the need for a better understanding of the methodology behind school

facility design decisions, and an effort to determine if these decisions truly represent the needs of 21st-century learners. There is an increasing interest on the part of researchers (Ahrentzen & Evans, 1984; Li, Locke, Nair, & Bunting, 2005; Newman & Thomas, 2008; Tanner, 2000) to gain further knowledge about the involvement of users, specifically students, in the design process. As true stakeholders in 21st-century learning, students should be given a role in the design process.

The current process for the programming and design of school facilities seems to be trapped in the past. While continuing revelations in educational research are pioneering substantive changes in curriculum and instruction, improvements to school facilities seem to lag behind. We have reshaped how and what we want our children to learn. We have even created the measurements to assess their level of achievement. It would seem however, that we have forgotten to reshape our school facilities.

As Payne and Tyler (2009) suggested, “In response to these trends, architects and educators must rethink the criteria for effective classroom design” (p. 80). Innovation is discussed but rarely pursued or implemented in new school facilities. Nair (2009) challenged the idea of simply rebuilding our aging and decaying schools by suggesting, that “if we simply repair broken structures, we will ignore the real problems with American education, while giving renewed life to a model of teaching and learning that has been obsolete since the end of the industrial era” (¶ 2).

Statement of the Problem

In order to realize substantive changes in the design of new school facilities, architects and educators must reach beyond the norms of past designs. As Van Note Chism (2002) indicated, “we know too much about how learning occurs to

continue to ignore the ways in which learning spaces are planned, constructed, and maintained” (p. 5). Current programming and design efforts should be examined to determine if a more effective outcome is attainable. The collaborative efforts of architects and educators should result in facilities that enhance the learning environment.

The perceptions of administrators and educators should be explored to determine if they provide valid input to design professionals. As more and more educational facilities reach the end of their life-cycle, opportunities for new schools will continue to emerge. As Chen (2002) suggested, “this relationship – between the buildings our students, teachers, and administrators work in, and the quality of the work they do – should be better understood” (p. 2). According to Banning and Canard (as cited in Van Note Chism & Bickford, 2002a), “among the many methods employed to foster student development, the use of the physical environment is perhaps the least understood and most neglected” (p. 1). To take school facility design in a new direction, there is a need to verify if current efforts to generate facility programming accurately represent the needs of 21st century learners.

All students have the right to a quality learning environment. As Cornell (2002) indicated, our classrooms must begin to reflect the changes in teaching methods: the pedagogical shift should influence the learning environment. Cornell provided further emphasis, suggesting that “the industrial era begot an educational environment that has been in place since the late 1800s. That era has passed years ago, but we struggle to shake free from its legacy. It is time to move on” (p. 34). In order to provide a quality learning environment, architects must develop spaces with the needs of users in mind; or, as Cornell outlined, follow the principles of *user-centered* design. “The essence of the idea

is that the needs of the end user should constantly drive design... we need to be concerned with two kinds of users – instructors and learners” (p. 35). Quality learning environments should then take shape through user-centered principles by providing (a) comfort, safety, and health, (b) usability, (c) psychological appeal, and (d) functionality.

In an effort to establish a framework for evaluating educational spaces, the Center for Effective Learning Environments (CELE) indicated “the importance of engaging with the users of learning environments and other stakeholders to enrich understanding of how, and how effectively, environments support educational and other objectives” (von Ahlefeld, 2009, p. 1). As von Ahlefeld indicated, although evaluating quality in the learning environment is challenging, CELE has identified two broad policy criteria: (a) “capacity of the space to increase access and equity to education” (p. 2), and (b) “capacity of the space to improve educational effectiveness and promote acquisition of key competencies” (p. 2).

As educators seek to enhance learning opportunities, the evidence points toward the importance of the physical environment that houses the activity. In their analysis of the research literature regarding educational facilities, Moore and Lackney (1994) suggested:

In many cases there is no discussion of architecture. And yet, when one reads this literature with an architectural eye, much of it is pregnant with ideas, ways in which the appropriate design of educational facilities can set the stage for more easily, efficiently, and productively achieving the latest educational reform ideas. (p. 36)

Moore and Lackney further indicated that “despite the lack of comprehensiveness, there is empirical data on the impact of school design on important performance issues” (p. 36). There is considerable evidence to suggest that the quality of a learning environment can be assessed by evaluating its (a) physical size and dimensions, (b) flexibility or adaptability to educational needs, (c) aesthetic appeal, (d) user-centered characteristics, and (e) ability to provide the occupants with a comfortable and healthy setting.

If students are to realize a greater impact from new school facilities, they must receive adequate representation during the design process. As suggested by the CELE Exchange (2009):

It is perhaps self-evident that if students are central to learning and the mission of schools, then they would have a lot to say about their school environments.

However, the call to ‘listen to student’ in the Future Scotland Debate suggests that it still does not happen. (¶ 2)

As Abend et al. (2006) indicated, “case studies show that involving multiple stakeholders... in the design, planning, and management of educational spaces can have a positive impact on student motivation and educational outcomes” (p. 12). In order to realize improved learning environments, evidence suggests that students deserve a greater role during the design process.

Background

The need for school facility improvements in the United States is well documented. As Roberts (2009) noted, the 1995 General Accounting Office report “documented the extensiveness of the deferred maintenance deficits” (p. 368).

Unfortunately, since then spending on necessary repairs has decreased. Given the pattern of school facility spending in the United States, Roberts suggested, “the lack of adequate investment ensures that the inevitable process of continued deterioration will continue” (p. 368).

One of the primary motivators for funding school facility improvements is the presumed link between facility conditions and student achievement. However, Roberts (2009) began by observing:

The research literature connecting facility conditions to student outcomes is mixed, with findings ranging from no effects to substantial ones. The ambivalence of such evidence makes the case for investing in facility conditions harder to sustain against competing investment opportunities. (p. 369)

Roberts’ research was conducted to “illustrate a simple but important point; namely, that how we measure school facilities has important consequences for what is observed” (p. 378).

Roberts (2009) observed that the primary focus of research measuring the condition of school facilities in North America relies on “an engineering perspective” (p. 369). Rather than relying on research measured from an engineering perspective, Roberts suggested the importance of building “the case that it is essential to take the purpose of facilities into account when considering their connection to learning outcomes” (p. 369). Rather than relying on the use of a “property-management perspective” (p. 370), Roberts indicated the need for developing a method of purpose-based evaluations.

Roberts (2009) conducted testing comparing the results of a commonly utilized Facility Condition Index (FCI), and an instrument called the Commonwealth Assessment of Physical Facilities (CAPE). Unlike the FCI assessment, the CAPE provided a measure of descriptive and evaluative measures. Roberts concluded:

The evidence illustrated in this report suggests that property-management measures of school facilities provide few clues to the learning environments in schools . . . On the other hand, it appears that measures that use an educators' perspective on school facilities do have reliable relationships to learning environments. (p. 378)

In summary, Roberts suggested that if FCI assessments were the only factors utilized to drive facility improvement decisions, limited support would be attainable. "There is clearly much room for more systematic conceptualization and measurement of how school facilities should be measured from an educator's perspective" (p. 378). This further indicates the importance of the educator's role during the design and programming phases of school facilities. It also supports the need for a greater understanding of both teacher and student perceptions regarding the learning environment.

Researchers have provided evidence that improved facilities have a positive impact on student achievement. (Bishop, 2009; Crook, 2006; Uline & Tschannen-Moran, 2008). After teaching experiences in both older and brand new facilities, Bishop noted a "perceptible difference in feeling among students and staff in a new building compared to that noted in and older building" (p. 1). Bishop's perceptions regarding the impact of new facilities led to research intended to measure the impact of new facilities

on the behavior of both students and staff. Bishop's qualitative case study utilized principal interviews and focus group interviews at three recently completed new high schools in Virginia. The purpose of the research was to identify the perceptions of the principal, students, and staff at each facility regarding the impact of specific design elements on improved student attitudes and behaviors.

Bishop (2009) indicated three emerging themes from this study: (a) a belief on the part of principals and staff that student behaviors improved in their new facilities in comparison to previously occupied older facilities, (b) morale and attitude improved among both students and staff in the newer facilities, and (c) an interesting belief on the part of both principals and focus group members that the newer facilities did not have a more positive impact on student achievement than the older facilities.

Recognizing that some previous research literature (Picus, Marion, Calvo, & Glenn, 2005; Roberts, 2009) has shown mixed, or even the opposite, conclusions regarding the impact of new facilities on student achievement, further research seems appropriate to gain a better understanding about the perception of administrators and staff regarding new facilities. If the perceptions of principals and teachers regarding completed facilities are inaccurate, perhaps their input and decisions during the design process are also flawed.

Crook (2006) sought to determine if a relationship could be drawn between the condition of educational facilities and the percentage of students passing the Standards of Learning (SOL) examinations. As Crook noted, "Recent educational reform has placed a high emphasis on standardized test scores and instructional change without mentioning the relationship between the educational facility and student achievement." (p. 4). The

data components used to form this study were: (a) the percentages of students passing the SOL examinations in the high schools in Virginia, (b) response of principals to the Commonwealth Assessment of Physical Environment (CAPE) assessment, and (c) the percentage of students participating in the free and reduced lunch program as a measure for determining the socio-economic status (SES) within the study. After factoring for SES, the results indicated that students attending schools receiving substandard CAPE results scored significantly lower on SOL examinations.

Crook (2006) indicated a direct correlation between facility conditions and student achievement. Because improved facilities contribute to academic achievement, the need for appropriate input from teachers and administrators in the design process of school facilities takes on a significant role. The understanding and communication of student needs between the parties involved in facility designs seems critical to the desired outcome of the project.

Uline and Tschanne-Moran (2008) sought to confirm a link between the quality of school facilities and student achievement. Seeking to further more than four decades of research that provided a link between school climate and student achievement, their study examined the correlation between the quality of facilities, resource support, school climate, student SES, and student achievement. Their goal was to determine if school climate had a mediating influence on student achievement.

Teachers from 80 middle schools in Virginia were surveyed to obtain the data regarding the quality of facilities, resource support, and school climate. Data on student achievement were obtained using eighth-grade Virginia SOL tests. To determine socio-economic status, data regarding the proportion of students receiving free and reduced-

price lunches were obtained from the Virginia Department of Education. Uline and Tschanne-Moran (2008) concluded “that school climate plays a mediating role in the effects of the quality of school facilities and student achievement” (p. 68).

The age and condition of facilities also affects student and staff behavior and attitudes. Hickman (2002) investigated the impact of new high school facilities on student behavior and staff attitudes in 13 selected Ohio schools. The new facilities represented a diverse sample of rural, small city, suburban high schools. Data were obtained through surveys completed by superintendents, high school principals, assistant high school principals, and high school guidance counselors.

In conclusion, Hickman (2002) identified the four key groups used in this study as “a fairly good cross section of individuals who have ‘the pulse’ of what goes on within their respective school systems” (p. 130). However, Hickman also indicated superintendents struggled to answer questions regarding student attitudes and behavior, going on to suggest an appropriate revision to this study “would be to include students’ or community residents’ survey responses and perceptions regarding fellow students” (p. 127).

Building on the platform of research supporting the link between school climate and student achievement, Lee (2006) conducted quantitative research to examine the specific impact of new school facilities on school climate. The purpose of Lee’s study was to draw a “construction-to climate-to educational outcome” (p. 55) conclusion. Teachers, paraprofessionals, support staff, administrators, and professional support personnel from 67 Gloucester, New Jersey schools completed the *Charles F. Kettering School Climate Profile* in an effort to compare their perceptions between prior old

facilities and newly occupied facilities. Lee's study indicated a direct correlation between new facilities and the perceptions of staff regarding school climate.

Lee (2006) also suggested further research regarding the importance of leadership on the construction of new school facilities. Involving the proper individuals in the design process seems to be critical to the success of the completed project. To achieve the appropriate changes in the design of learning environments, the appropriate input must be obtained.

Tanner (2000) suggested that the expectations for public education have increased dramatically in recent years. "Waves of school reform have passed with the intent of raising standards for students, teachers, and administrators" (§ 1). Tanner indicated further concern noting: "unfortunately, the one part of our education system that we do not hold to a higher standard is the way our schools are planned, designed, and built" (§ 2).

In contrast to dramatic changes in educational delivery, new facilities are being designed and constructed with little change from the outdated designs of the past. The fear of real or perceived failures seems to inhibit the decision making process. Take for example the open space schools that emerged during the 1970s. While labeled by many educators as failed experiments, others would suggest they were in fact a success when properly utilized. As Ahrentzen and Evans (1984) indicated:

New practices in school design, such as open space schools and classroom lofts, have been implemented in recent years. Unfortunately these innovations frequently engender concerns about the suitability of these design innovations for classroom study. For example, critics of open space schools claim that excessive

noise and visual stimulation of open space schools have adverse, distracting effects on students. (p. 438)

The purpose of their study was to “discover whether particular classroom environmental features influence distraction, privacy, and general satisfaction for students and teachers” (p. 440). While the impact of environmental influences on distraction was found to be prominent among teachers, few architectural features were found to affect student distraction. In summary, Ahrentzen and Evans indicated “it is clear that students and teachers respond differently to classroom design features” (p. 450). They further suggested that:

Classroom innovation, however, is not the sole property of the architect. Students and teachers can become more involved in creating and changing their environments . . . If researchers can eventually develop a working taxonomy of important classroom design features that influence user behavior and satisfaction, then we can aid others in intervening in the design of classroom spaces intelligently. (p. 452)

Recognizing the differences in student and teacher responses suggests a clear need for involvement of both parties in the design of new facilities. To determine whether teachers provide adequate insight into the needs and preferences of students during the design and programming of new facilities deserves further research.

Evidence suggests that the design process must change in order for the facilities to change. As Li et al. (2005) suggested:

The purpose of the school development process is to shift the focus away from the building and toward the goals of the facility: to support the teaching and learning

modalities of the 21st century, . . . Such purpose built schools will almost never look and feel like their traditional counterparts because they do not begin with the assumption that classrooms and corridors are the basic building blocks for every school. (p. 20)

Li et al. also stated that a successful development process “starts with involving as many stakeholders as possible” (p. 20). Students are integral stakeholders in 21st century learning and should be given a corresponding engagement in the design process.

While addressing critical infrastructure needs, most school remodeling projects create little if any change in the physical layout of the facility. In many cases few, if any, changes are made to the composition of the learning environment. New schools are also constructed each year to replace outdated and aging facilities. Unfortunately, despite the dramatic changes taking place in education, most new school facilities lag far behind in their innovation.

This is an intensely active time in school construction, and yet schools are built or renovated every day without input from students. Architects design monuments to themselves instead of places to support learning and curriculum. Educators occupy environments and use equipment they don't fully understand and can't exploit to the fullest. Children learn to tune out the environment rather than develop awareness and a sense of belonging. (Taylor, 2000, p. 5)

Taylor (2000) outlined an integrated model for addressing school facility design and curriculum integration, the School Zone Design Model (SZDM). The SZDM encompasses the primary concept that a learning environment makes a difference in and contributes in a direct way to student behavior and learning. The model incorporates a

process for programming educational facilities by first identifying context, content, and learning processes. Understanding the relationship between education and architecture within these areas should then be utilized to make programming and design decisions. The desired outcome of the process is an educational facility that is designed as an active learning tool.

In conclusion, Taylor (2000) suggested:

The instructional delivery system of schools is changing, and past models do not reflect the impact of technology and the information highway on the use of space in schools by both teachers and students, let alone community. In fact, classrooms as we know them today may be eliminated entirely in the future. At the very least they must be configured differently now that roles are changing. (p. 46)

Architects must recognize these changing roles and avoid simply perpetuating school facilities based on isolated individual classrooms along double-loaded corridors.

Statistics from a 1999 report by the National Center for Education Statistics (NCES) indicated that the average school facility in the United States is 40 years-old (as cited in Taylor, 2009). As school buildings continue to age, it is clear the need for facility improvements will remain a pressing need for the educational community. It is also, as Taylor suggested, a call to action: an opportunity for an innovative approach to school facility programming.

It would be a tragedy to compound the problem of inadequate facilities by repeating outmoded designs that are unsafe, do not apply to the latest educational theories, and fail to support sustainable, ecologically good design. Our children deserve schools that give them a sense of dignity, worth, and freedom. (p. 8)

In order to achieve these results,

Architects and educators must understand each other and develop a shared vocabulary encompassing educational theories, developmental requirements of growing children, aesthetic theory, and practical issues in designing schools. Our children will reap the rewards of this integrated approach when they are able to occupy spaces designed expressly to stimulate their natural curiosity, where architecture is not a vacuous space but a learning tool. (Taylor, p. 3)

It is in everyone's best interest to develop a greater understanding of the impact educational facilities have on the academic success of children.

Most architectural programs for school facilities are developed using predetermined needs and baseline technical requirements such as square footages or standardized educational specifications. Taylor (2009) pointed out, however, the unfortunate tendency is for programs to “bog down with budgets or value engineering before achieving higher-order values such as curriculum, enduring usefulness, beauty, or sustainability” (p. 5). The author further suggested “a call for more empirical data and corresponding medical research to support new findings in education” (p. 13). As research continues to show evidence of the link between school facilities and student achievement, “how much more time will pass before educators and designers translate this information into positive action” (p. 13)?

Taylor (2009) suggested a parallel emphasis be developed between the insights taken from developmental psychology and the enduring definitions of architecture as identified by a first-century Roman, Vitruvius. This relationship was used to form an illustration labeled “Holistic Goals of Educational Facility Design” (p. 6). The illustration

suggested three parallels be considered in order to align the goals of education with the goals of architecture. “From these humble parallels of body/structure, mind/function, and spirit/beauty, we begin to see the types of questions we must ask before we design educational facilities” (p. 6). The questions emerging should then fall along three lines:

1. What building systems will facilitate physical learning?
2. How can the designed spaces be developed to support the mind?
3. What components or elements of the design will bring stimulus to a child?

(p. 6)

Following these lines in a collaborative spirit should help architects and educators develop new or renewed facilities which are better equipped to meet the needs of 21st century learners.

Drawing from recent research findings, Newman and Thomas (2008) suggested that “children are competent and active members of society, who can and should have a say in aspects of social life that concern them” (p. 238). Newman and Thomas concluded that even though “schools are not provided with sufficient guidance or methods to enable student participation in the design of new schools” (p. 248), staff and students discovered many positive aspects from the process. Overall their study indicated “the capability of young people to comprehend issues that have often been thought too complex for them, or are conceptualized as simply not their concern” (p. 249).

Although the idea of involving students in the design process is not a new idea, it somehow lacks implementation. Documented standards (Myers & Robertson, 2004; Seattle School District, 2002) suggest or prescribe the involvement of students in the programming and planning of school facilities. The United Kingdom’s own government

watchdog on architectural matters, the Commission for Architecture and the Built Environment (CABE) has warned that “there is insufficient effort being made to consult the users of school buildings” (as cited in Burke & Grosvenor, 2003). Unfortunately for architects and educators, none of the standards define or outline specific procedures for engaging students in the process.

As Grummon (2009) suggested, “engaging those who will use the learning space in its planning yields the greatest benefits, yet the people who manage a space usually determine its design” (§ 1). It is interesting to note that in the related areas of curriculum design (Marquis, 1973; North & Brock, 1986; Tyler, 1977), and educational technology design (Druin & Solomon, 1996; Guha et al., 2005), researchers have also identified the value of student involvement, even utilizing children as young as four to six years of age in the design process.

When students are consulted, those responsible can gain valuable insight into the design of school facilities. What works and what does not work; what aspects of the school facility actually help to engage students in the learning process? Having a better understanding of their perceptions regarding the learning environment can contribute to the design and programming of educational facilities in significant ways.

In 2001, the Guardian, a United Kingdom national newspaper, sponsored a competition called ‘The School I’d Like’. Repeating a similar effort from 1967, the competition asked students to share how they felt about their schooling, and design the school of their dreams. In documenting the results of the competition, Burke and Grosvenor (2003) suggested that the competition had illuminated “ways in which the built environment is understood and experienced by school-age children” (p. xii). Burke

and Grosvenor went on in the preface of the book to suggest, “no one reading the collection will be left with any doubt that children and young people are capable and entitled to help to shape their present and future” (p. xiii). The authors concluded that “if schools are to be a successful vehicle for learning in the twenty-first century, it is essential that young people are involved in determining their nature, design, organisation, ethos and use” (p. 9).

Research Questions

The purpose of this study was to develop a better understanding of the potential benefits from greater student involvement during the programming and design phases of school facility projects. As Lee (2006) suggested, “better facilities may be considered synonymous with enhanced educational outcome. We should ask how we know that new facilities lend to an improved product” (p. 4). Previous research has shown the benefits of asking students to aid in the post-occupancy evaluation process (Lackney, 2001). Rather than waiting until the facility is completed, the evidence suggests that student participation is equally critical in yielding valuable insight prior to construction, engaging them as co-design participants from the outset of the programming and design process (Grummon, 2009; Newman & Thomas, 2008; Taylor, 2009).

To gain further knowledge of the impact of student involvement, this study explored the following questions:

1. What are the perceptions of educators (teachers), and students in a grade nine through twelve high school setting regarding the physical design characteristics of their learning environment?

2. What perceptions do educators (teachers) in a grade nine through twelve high school setting have regarding the validity of student involvement as a source for input and recommendations regarding the design of new high school facilities?

3. What are the perceptions of high school principals regarding the involvement of students in the design of a new high school facility?

4. What are the perceptions of architects regarding the involvement of various stakeholders, including students, during the design and programming phases of a school facility project?

Description of Terms

Architect. Architects are licensed professionals trained in the art and science of the design and construction of buildings and structures that primarily provide shelter.

Architecture. Architecture refers to the profession of designing buildings, open areas, communities, and other artificial constructions and environments, usually with some regard to aesthetic effect. Architecture often includes design or selection of furnishings and decorations, supervision of construction work, and the examination, restoration, or remodeling of existing buildings.

Building. Building refers to a permanent structure for the purposes of housing a specific function.

Case study. Case study research is “a qualitative research approach focusing on a unit of study known as a bounded system (e.g., individual teachers, a classroom, or a school)” (Gay, Mills, & Airasian, 2009, p. 426).

Classroom. The physical space or room within a school where group instruction occurs.

Design. The specific shape, form, and detail of a physical structure, building, or room.

Design process. The process of solving an architectural problem of how to produce a building or structure that will satisfy the programming and functional needs of the occupants.

Educational facilities (school facilities, school buildings). Includes any structure or building used by a school district for the education or instruction of students.

Educational specifications. “Educational specifications serve as the written documentation of the educators’ intent for program delivery and defines the physical parameters of the learning environment, both building and site” (Myers & Robertson, 2004, p. 5-2).

Facility conditions. Refers to “the physical condition of buildings and major building features” (United States General Accounting Office, GAO, 1995, p. 5).

Infrastructure. Building infrastructure includes the underlying or central components that provide for the health, safety, and welfare of occupants.

Learning environment. For the purposes of this study, learning environment refers to the physical location where learning occurs, primarily the classroom.

Mixed-methods study. Refers to a research design that includes both quantitative and qualitative data in a single study (Gay et al., 2009).

Perception. In the context of this study, perception refers to the act of using the flow of information from the environment to guide the construction of a more or less accurate model of the framework of the environment. Perception involves two components: perceiving and impression. Perceiving is the process of using senses to

acquire information about the surrounding environment or situation. Impression is an attitude or understanding based on what is observed or thought. Perception involves organizing, ignoring, and interpreting information from our surroundings.

Post-occupancy evaluation (POE):

A Post-Occupancy Evaluation is an assessment of a building's performance undertaken by taking into account specific criteria and involves soliciting input from the building's users. That is, is the building working for those who use it? Does the building function in ways it was intended to? The information gathered by conducting a POE is utilized in a number of ways, but is primarily intended to provide feedback to planners and architects of buildings so that lessons may be learned both from the successful and unsuccessful elements of a building's design. (Design Share Awards, 2000, ¶ 1.1.1)

Programming. Refers to the efforts conducted by the architect prior to the design of a facility. As Taylor (2009) indicated, "architectural planning for a facility; determining needs before design" (p. 418).

Stakeholder. Merriam-Webster's Online Dictionary defined a stakeholder as "one who is involved in or affected by a course of action" ("Stakeholder", 2010). For the purpose of this study a stakeholder refers to school facility occupants including school administrators, teachers, and students who are affected by the design decisions and physical conditions of the building.

User. For the purposes of this study, user refers to the occupants of a school facility, primarily students.

User-centered design. As Cornell (2002) indicated, “the essence of the idea is that the needs of the end user should constantly drive design” (p. 35).

Significance of the Study

Despite significant changes in curriculum, and efforts to dramatically improve student outcomes, school facilities remain tied to previous models. As Payne and Tyler (2009) noted:

Many schools have moved away from the traditional lecture-style approach to instruction in favor of a project-based curriculum that emphasizes collaboration and flexibility. At the same time, the current generation of tech-savvy students and teachers are using technology in ways never before imagined. (p. 80)

Architects and educators must gain a better understanding of the criteria for effective classroom design. The purpose of this study was to determine if greater student involvement in the design process is necessary to yield new perspectives on school facility designs.

Unlike the prevalent body of research focusing on the post-occupancy impact of facility designs, this study focused on the importance of the process that occurs before the construction of a new school facility. The American architect Sullivan (1896) coined the phrase “form ever follows function” (p. 403), a phrase which still dictates the design philosophy of many architects to this day. However, in order to determine the function of school facilities, designers and educators must ask the right questions of all users. The responsible parties must adequately consider the needs of students by seeking their input.

This mixed-methods study sought to determine if principals and teachers adequately represent and accurately reflect the needs of students during the design of new

facilities. The research was conducted to explore the perceptions of principals, teachers, and students regarding the impact of school designs on the learning environment. Having a better understanding of the shared or differing perceptions between educators and students was intended to assist architects and educators as they develop the programming and design of new educational facilities. Providing a framework for the importance of including students in the design process was also intended to help address absence of their voice in the process. The results of this study endeavored to provide school administrators and architects with vital assistance in developing optimal learning environments.

Process to Accomplish

This study was intended to build on the body of quantitative research linking the impact of school facilities with student achievement (Bishop, 2009; Crook, 2006; Hickman, 2002; Uline & Tschannen-Moran, 2008). Although the focus of this study was not directed toward a further understanding of the impact of facilities on student achievement, the body of research linking facilities to educational outcomes clearly suggests the importance of quality in the physical setting of the learning environment. Many of the researchers who utilized quantitative studies for this purpose have suggested the need for qualitative research to gain further understanding of the perceptions of the participants. Crook indicated that a qualitative analysis of teachers' perceptions was warranted. Hickman also suggested:

The free responses, gathered as a part of this quantitative survey, indicated that further research utilizing a qualitative approach to assess the relationships that existed with new school buildings might need further exploration. A focus group,

individual interviews, or both appear to be another good method of researching the facility conditions on the relationships between student and staff behavior and attitudes. . . . (p. 131)

A mixed-methods study was conducted to draw correlations between the quantitative and qualitative findings. As Robson (2002) indicated, multiple methods “can be used in complimentary fashion to enhance interpretability” (p. 371). The intent was to first understand the perceptions of both teachers and students regarding the physical learning environment. After comparing these perceptions, additional research was also conducted to develop an understanding of the design process utilized for each facility.

The first component of research utilized the Organisation for Economic Co-operation and Development (OECD) Center for Effective Learning Environments (CELE) student and staff questionnaires. Originally developed for an international pilot study on the evaluation of quality in educational spaces (EQES), the questionnaires were intended “to collect data from staff and students on subjective aspects related to quality in educational spaces” (CELE-OECD, n.d., p. 6). The EQES questionnaires were utilized in this study, as intended in their original use by CELE, to “better understand how staff and students perceive quality in educational spaces” (p. 6). They were also intended to obtain quantitative data to help compare the participant perceptions regarding the learning environment. As Gay et al. (2009) indicated, survey research “determines and reports the way things are” (p. 9). The EQES assessment tool was also intended to identify any differences in the perceptions of the two participant groups: teachers, and students. As Robson (2002) noted, “it is possible to go beyond the descriptive to the interpretive, that is, to use the survey to provide explanations of the phenomena studied and the patterns of

results obtained” (p. 235). The EQES results were also intended to lend added insight to the qualitative side of this study. The surveys were conducted utilizing a sample of teachers and students from four recently completed new high school facilities located in a Midwestern state.

The second component of research involved interviews among participants from the same four high schools utilized for the initial survey research. Interviews were conducted using a random subset of the teacher participants in order to provide an understanding of their perceptions regarding the validity of student involvement as a source for input and recommendations in the design of new high school facilities. A separate interview was also conducted with the principal of each high school to gain additional insight regarding the programming and design process from their perspective. The primary intent of the interview portion of the study was to determine (a) if students were given a meaningful voice in the design process of the new school facilities, and (b) if not, was their lack of participation due to a perceived lack of credentials or ability to provide meaningful contributions to the process.

Four recently completed new high school facilities were selected from the Midwestern state in order to provide a representative sample of new schools for both the quantitative and the interview portion of the research project. Corresponding teacher participants were utilized during both the EQES and the interview portions of the research. Principal interviews were conducted individually, and separately. Teacher interviews were conducted in separate group settings, by school facility.

In addition, a representative from the architecture firm involved in the design of each facility was interviewed in order to understand the process and procedures utilized

to obtain input from stakeholders during the design and programming phase of the project.

CHAPTER II

REVIEW OF THE LITERATURE

Introduction

Given the magnitude of total spending on education, there is a significant level of public scrutiny regarding all aspects of our educational system. According to the Education Finance Statistics Center (EDFIN), total expenditures in fiscal year 2007 exceeded \$562 billion (EDFIN, n.d.). In the same year, capital outlay and interest on debt expenditures by United States public and secondary schools exceeded \$77.6 billion, representing 13.8% of the total school expenditures. The age and condition of school facilities is well documented, but how can we be certain that the funds allocated to improve, renovate, or reconstruct educational facilities will actually improve learning? As Black (2007) indicated, “Politicians, school officials, and school designers often proclaim that new schools will raise student achievement, but they’re hard pressed to explain how or why” (p. 40).

We see dramatic changes occurring in educational delivery. Pedagogy is being altered to recognize the differences of 21st-century learners. Unfortunately new or remodeled buildings continue to emerge from the design process with little change from the factory model developed for schools in the late 1900s. School designers seem trapped in perpetuating facilities based on past practice. The process utilized for the programming and design of school facilities seems oblivious to the changes going on inside our classrooms.

The phrase *form follows function* may be one of the most often quoted lines among members of the design profession. Sullivan (1896) introduced the original phrase “form ever follows function” (p. 403). Members of the Bauhaus School in Germany utilized the slightly truncated version of the phrase, *form follows function*, as a central tenant of the modernist architecture movement that emerged early in the 20th-century. The basic premise, that maintains a strong influence among architects to this day, suggested that the function of a building should influence the design, that the activity of the occupants should shape the design of the facility. For years school facilities reflected the educational activity they housed. Unfortunately however, despite the changes in the function of education, it would appear that school facility design has become trapped in its own past. At best, change has come very slowly for school facility design. In order for form to continue following function, we must be willing to gain a better understanding of the changes going on inside school facilities. Who better to tell us about the functional aspects, what works or does not work, than students themselves?

History of School Facility Design

Understanding the influence of 19th-century architecture on current day school plans is somewhat difficult. As Gislason (2009) suggested, “The historical research on school architecture is fragmentary” (p. 230). Specifically, Gislason noted that the majority of significant writing on the subject “focuses on the 19th century and does not follow the development of school design into later periods” (p. 230). The sparse availability of literature on 20th-century school design challenges research endeavors, but perhaps is an indication of the slow pace of change in the planning and design of educational facilities. As Gislason concluded:

In all, I posit that (a) school design has evolved gradually over the last 200 years and has built on existing innovations rather than revolting against them, and (b) the architecture and organization of schools have shifted significantly over time and continue to change. (p. 231)

Gislason outlined the pattern of school architecture from 1978 to present in an attempt to define the development of “pivotal developments and link them coherently” (p. 230).

Gislason (2009) identified “the emergence and evolution of the classroom” that occurred between 1798 and 1921 (p. 231). The well established *grammar school* plan came into question at the onset of the 19th-century as school boards in both Great Britain and North America debated the advantages of the competing *monitorial school* plan. Grammar schools provided a system allowing multiple classes in one schoolroom. As Gislason suggested, The Academy at Rome (Figure 1), opened in 1848, demonstrated a “standard example of a well appointed Victorian grammar school” (Barnard as cited in Gislason, p. 231).

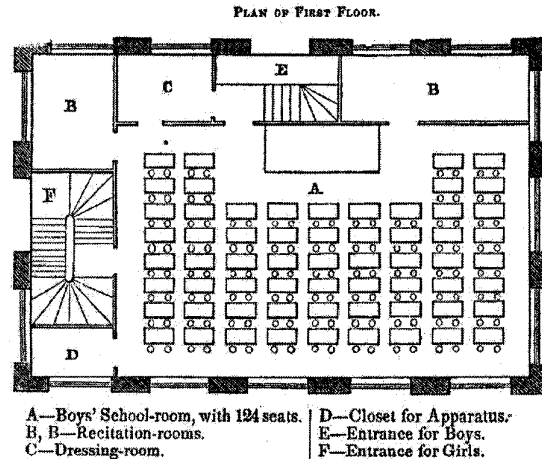
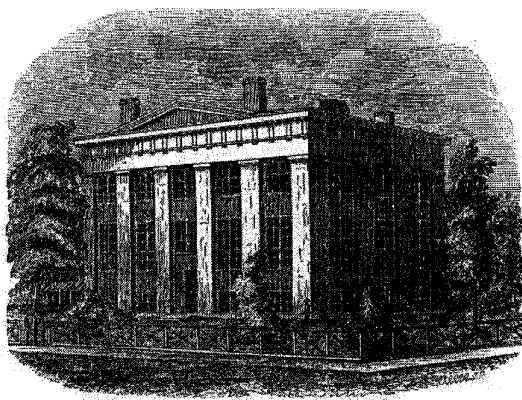


Figure 1. The Academy at Rome, New York.

Note. From “Building paradigms: Major transformations in school architecture,” by N. Gislason, 2009, *The Alberta Journal of Educational Research*, 55(2), p. 232. Copyright 2009 by the Alberta Journal of Educational Research. Reprinted with permission.

However, as Gislason indicated, “A significant drawback to the grammar school model was that the school-master could offer only so much simultaneous instruction to the whole school given the overall differences in student ability” (p. 231). The grammar school reflected a significant reliance on textbook work that was validated through a student’s ability to recite facts. As Gislason concluded, “Educational content was consequently short on context and long on bare fact” (p. 231).

As Gislason (2009) indicated, the monitorial system emerged as an approach to address “the question of how to engage a wide range of students simultaneously” (p. 232). Gislason noted that the monitorial model, as illustrated by Lancaster’s seminal Borough Road school opened in 1798 (Figure 2), “aimed to maximize the number of students that could be taught effectively by a single master” (p. 232). It is important to

note that the primary shift in architectural design, from the grammar school plan to the monitorial plan, was based on function, on pedagogical changes within the classroom.

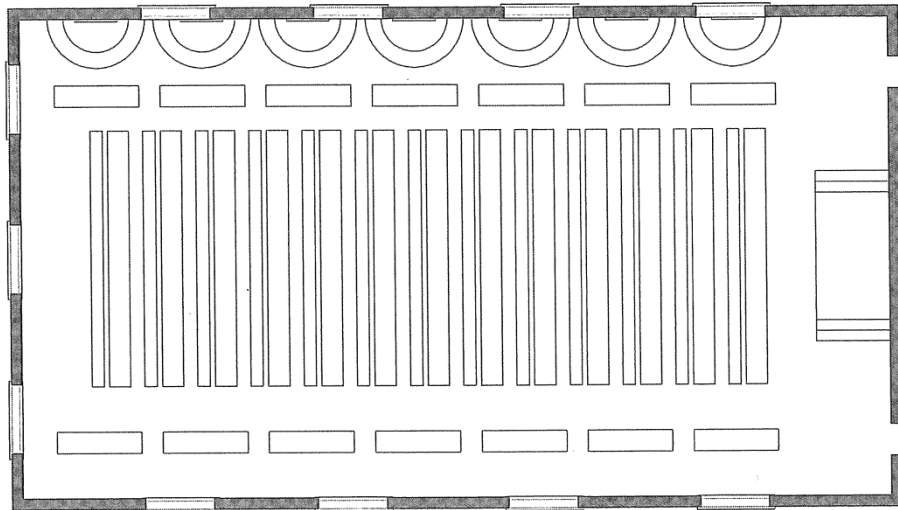


Figure 2. Lancaster school floor plan.

Note. From *Evidence-based design of elementary and secondary schools: A responsive approach to creating learning environments* (p. 79), by P. C. Lippman, 2010, Hoboken, NJ: John Wiley & Sons.

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As Gislason (2009) observed, the *graded grammar school* emerged in Boston as the result of a policy change “in developing a school model that enabled a controlled classification of students by ability” (p. 234). The first fully graded school in North America, the Quincy Grammar School-House was constructed in 1847 (Figure 3).

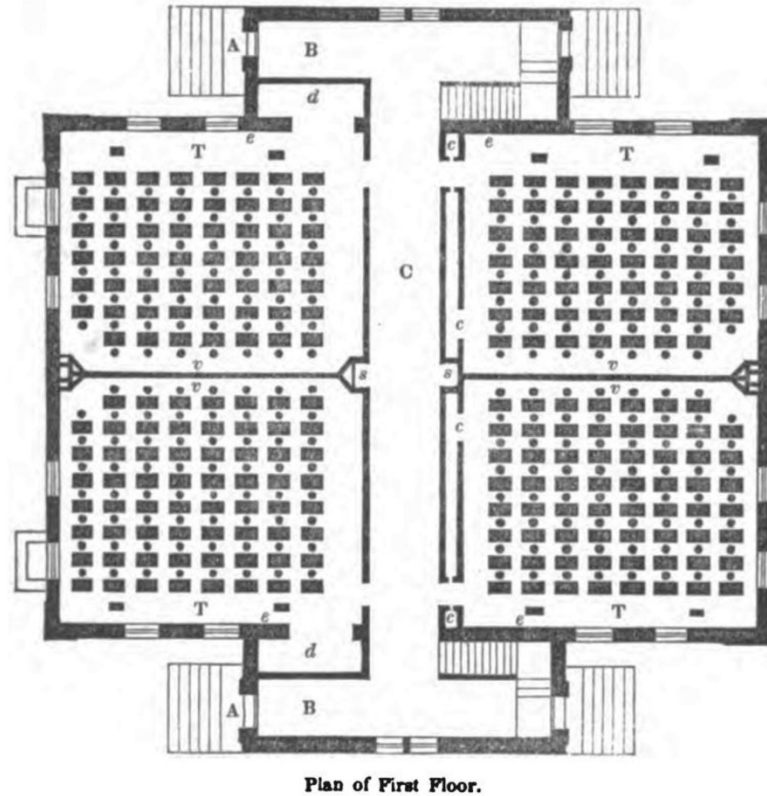


Figure 3. Quincy Grammar School-House.

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Quincy consisted of four floors total, three lower classroom floors capped by a fourth floor gymnasium. As Gislason noted:

The Quincy layout marked an important departure from both the monitorial school model and the grammar school model: Quincy was in fact a radical synthesis of the two models. It resembled a monitorial school insofar as the sub-master, the usher, and the teaching assistants carried out the principal’s instructions much as monitors would have carried out the headmaster’s instructions in a monitorial school; but the teachers and assistants were assigned

to separate schoolrooms, as were teachers in the grammar school model. Quincy was thus like a collection of individually graded grammar schools systematically joined together. (p. 234)

As the plan of Quincy indicates, the idea of a main corridor flanked by individual classrooms emerged as a result of an educational model. Instructors and students were separated into individual self-contained compartments, or single-graded classrooms. Barnard (2005) outlined the four advantages that the single-graded classroom provided in contrast to earlier school models. First, teachers could develop age specific lessons. Second, separate classrooms offered both visual and acoustical separation, thereby minimizing distractions from other grade levels. Third, based on their level of progress, students could easily be placed in the appropriate academic grouping. Fourth, the single-graded classroom afforded the teacher a greater amount of time to tailor subject content and “the most skillful and varied methods of teaching” (p. 127). As Gislason concluded:

Taken together, these four factors reflect the inextricable link between the architecture of the graded classroom and the modern concept of the classroom teacher as a knowledgeable, pedagogically dynamic individual who is responsive to the needs of a given class. (p. 235)

Gislason also suggested, “The Quincy Grammar School-House not only set an important architectural precedent, then, but further signaled a paradigm shift with respect to education practice” (p. 235).

As Gislason (2009) noted, modernization of the graded grammar school followed during the latter half of the 19th-century (p. 235). Political support and public funding for public education increased allowing for additional refinements, some as simple as quality

blackboards, or readily available maps and globes to contribute to the educational environment. Advancements in building technologies such as improved heating and ventilation systems, windows, and running water were incorporated into school facilities. As shown in Figure 4, the Tasker School illustrates how political sentiment, favoring the advancement of public education, even contributed to façade improvements.



Figure 4. The Tasker School.

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One influence in particular had a profound impact on the design of school facilities. Under the 19th-century public health movement authorities encouraged architects to plan public facilities, including schools, to address health concerns through design parameters. Increased day-lighting, and natural ventilation were incorporated into schools to respond to health concerns. As Gislason (2009) concluded:

The end result of the demand for the more light and natural ventilation was that the design of public buildings moved away from a singly massed block – which is precisely what we see in the Academy, Quincy, and Tasker School – toward more articulated layouts that provided better access to the outdoor environment.

(p. 236).

Rapid expansion of urban areas combined with the modernization of buildings near the end of the 19th-century led to the advancement of the Quincy model. In addition, the rise of the industrial and commercial economy during the same time period shifted school curriculum toward subjects considered to be more practical. Subjects such as chemistry and physics warranted new spaces within school plans.

Early in the 20th-century, educators continued to respond to the advancing industrial economy by introducing manual training and technical subjects in school curriculum. As Gislason (2009) noted:

This diversification meant that more specialized instructional areas had to be provided and that teacher education became more subject-specific and departmentalized. Schools thus grew larger as policymakers minimized costs by putting more students into each building; and curriculum became more compartmentalized and diverse as schools adjusted to the demands of the new economy. The tendency to increase school size while broadening the curriculum would eventually eliminate the layout of the comprehensive school ... (p. 237)

Developments in both educational and building systems had combined to force a shift away from the simplicity of the grammar school plan. School facilities, as a result of a

response to curriculum needs, were gradually being transformed into the more complex footprints we recognize today.

As Gislason (2009) suggested, “The Group Plan of the Oakland Technical High School represents an even more marked departure from the solidly massed plan of the 19th-century school” (p. 237). Gislason attributed several combined factors to “its sprawling and variegated quality” (p. 237), including “(a) the health movement, (b) curricular diversification, and (c) investment in land and building construction” (p. 237). Gislason concluded that this layout was a precedent to the tendency of the “highly articulated site plans that gained momentum in the 1930s” (p. 237). While maintaining the integrity of the individual classroom, a single unit allowing individual and separate teacher control, more flexible and distributed plan arrangements were developed without compromising the function of the school as a whole. Even though the facilities had taken on more complex plan arrangements, the larger junior and senior high schools of the 1920s were still linked to the precedents established by the Quincy classroom.

While public and other outside influences shaped school architecture in the 19th-century, Gislason (2009) suggested that “progressive educational thought took center stage in the first half of the 20th century” (p. 238). The development of *progressive school design*, as outlined by Gislason, occurred between 1921 and 2009. Gislason concluded that the progressive school’s “defining moment occurred in 1896 when John and Mark Dewey opened their laboratory school for young children” (p. 239). As opposed to the regimented form of education that took place in traditional schools, Dewey felt education should more closely resemble normal social behavior. This change in pedagogy would suggest a corresponding change in the design of the facility.

Gislason (2009) also concluded that as education moved into the 20th-century school facility designs were already exhibiting the tendency to use old elements and pieces, specifically classrooms arranged in rows along a corridor, as standard components. Was the paradigm of the individual classroom already so strong an influence that true innovation was avoided? Had educators adequately envisioned or communicated opportunities to escape the paradigm? As Gislason noted, “Whereas progressive educators such as Dewey, Rugg, and Shumaker were vocal about making changes to traditional pedagogy and school design, school architects and policymakers were relatively quiet about school reform” (p. 239-240). Gislason further noted how Rugg and Shumaker “in their influential work on progressive education *The Child-Centered School*” (p. 239) viewed the relationship between the physical space and student as a critical component of a successful educational facility.

Key design principles, such as flexibility of spaces and furnishings, were viewed as “raw materials out of which the children themselves under wise guidance fashion their own curriculum” (Rugg and Shumaker as cited in Gislason 2009, p. 239). The child was considered an active participant in shaping both the physical space and their educational outcomes. As Gislason concluded, Rugg and Shumaker believed that school facilities were more appropriate when they were not “designed in a programmatically prescriptive manner” (p. 239), but instead provided enough flexibility to adapt to the needs of the students using them.

Gislason (2009) further highlighted how some architectural writers early in the 20th-century began to express concerns about the standardization of school facilities. Donovan’s 1921 work, *School Architecture; Principles in Practice*, (as cited in Gislason)

noted a “warning that ‘excessive [architectural] standardization [would] likely lead to stagnation’ as educational methods were changing and would have to be accommodated at some point” (p. 240). Gislason concluded that even though educational reforms were taking place, architects were slow to implement changes in the design of school facilities. Ultimately, “the tide of educational change would push architects and policymakers to consider how school design might be better aligned with progressive educational methods” (p. 240).

Gislason (2009) indicated that as educators adopted new pedagogy during the 1920s and 1930s, architects gradually realized the inadequacies of school facilities designed to support previous teaching methods. As Gislason noted, “It was arguably this shift in the interior life of classrooms that drove the tectonic shift among architects” (p. 240). In pointing to facilities by noted school architect Neutra, Gislason outlined the changes taking place within the individual classroom. Although Neutra suggested a transformation of the classroom (Figure 5), Gislason observed “that Neutra’s model is not a break from the past, but is rather a moderate reinterpretation of an existing classroom paradigm” (p. 242).

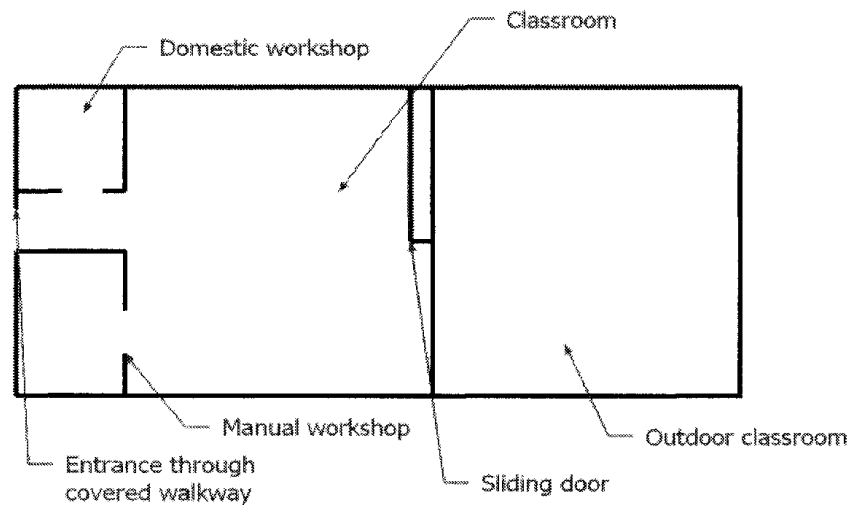


Figure 5. Neutra's activity classroom.

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As Gislason concluded, Neutra's recommendations for the overall building layout still echoed many traditional concepts (p. 242). Even when implementing new ideas, architects demonstrated a difficulty in making a clean break from previous design patterns. Nonetheless, as Gislason noted, "The sprawling, highly articulated, essentially suburban school plan sketched by Neutra (1935) and the other 1935 *Architectural Forum* contributors helped set the standard for school design in the second half of the 20th century" (p. 242). Despite their ties to the past, Gislason suggested however, that "Neutra's generation of architects actively promoted progressive principles as an architectural matter for the first time" (p. 242). Efforts were being made to advance designs based on educational reforms.

In what is considered by many architects as a seminal work in the design of school facilities, the Crow Island School, an elementary school opened in Illinois in 1940, offers what Gislason (2009) suggested as “a powerful early example of progressive school design” (p. 243). In response to the school district’s Winnetka Plan, Crow Island responded directly to the two types of learning activities occurring within the classroom. The morning focused on individual learning while the afternoon engaged students in group and creative activity. In developing the L-shaped classroom layout for Crow Island (Figure 6), Gislason acknowledged that the architect’s design of the classrooms were a direct response to the educational activity of students within the classroom (p. 244). However, as Gislason noted, while flexible-use designs became well accepted at the elementary level (p. 245), efforts to formulate progressive design principles at the secondary level were less common.

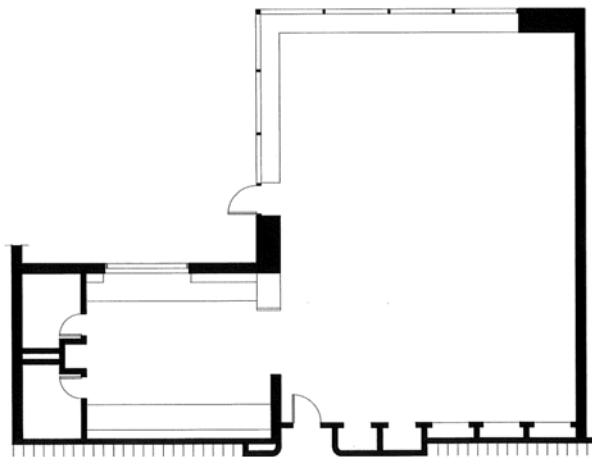


Figure 6. L-shaped classroom of Crow Island School.

Note. From *Evidence-based design of elementary and secondary schools: A responsive approach to creating learning environments* (p. 83), by P. C. Lippman, 2010, Hoboken, NJ: John Wiley & Sons. Copyright 2010 by John Wiley & Sons. Reprinted with permission.

As Gislason (2009) noted, in 1968, the Educational Facilities Laboratories proposed a specific departure from the individual classroom at the secondary education level. In its place, a *learning suite* (Figure 7) representing about three times the area of the typical classroom was prescribed. As Gislason suggested, “Several radical pedagogical and organizational implications follow from the suite model” (p. 245). New opportunities for team teaching and highly self-directed student activities emerged. As Gislason concluded:

Finally, the traditional notion of the classroom as a discrete space under the direction of a single teacher is superseded by a more fluid and collaborative plan. The suite model thus departs from both the traditional classroom paradigm and the activity classroom plan and transforms the basic organization of schooling. (p. 245)

Again however, resistance to the suite model suggested a difficulty on the part of educators, specifically the decision makers responsible for developing school design, to embrace change. As a result, the traditional classroom, and its repetitive linkage along finger-plan corridors remained the more common solution for school facilities built throughout the remainder of the 20th-century.

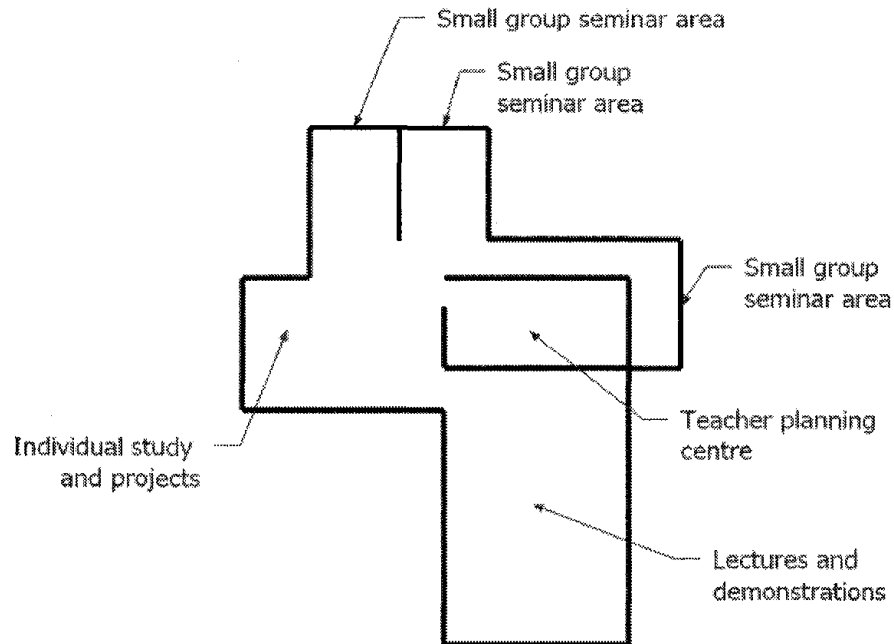


Figure 7. Learning suite.

Note. From “Building paradigms: Major transformations in school architecture,” by N. Gislason, 2009, *The Alberta Journal of Educational Research*, 55(2), p. 246. Copyright 2009 by the Alberta Journal of Educational Research. Reprinted with permission.

As we have moved forward into the 21st-century, many questions remain regarding the appropriate pattern for school facilities to follow. As Gislason (2009) noted, a growing focus on nontraditional school models “may ultimately spur architectural diversity and introduce new opportunities for implementation of progressive design ideas” (p. 247). Gislason also concluded:

Perhaps the critical question for now is whether the classroom will continue in its basic form, or whether it will be supplanted by some version, or multiple variants, of the learning suite. If the learning suite model ever becomes a major paradigm, it will mark a radical shift in school architecture: a whole form of pedagogy based

on the individual graded classroom will have given way to an educational model only remotely related to Quincy's legacy. (p. 247)

The future trajectory of school design is clearly dependent upon the interaction of architects and design professionals with the stakeholders of educational facilities. Since school architecture demonstrates the tendency to change gradually "by building on existing design trends rather than breaking from them" (p. 230), the importance of asking the right questions of the right people takes center stage. Understanding the significance of who we include in the process seems critical.

Lippman (2010) described the Colonial Period of school facility planning as "resistant design" (p. 75). As Lippman observed:

Since the United States was colonized and has evolved from an agrarian society to a technologically advanced empire, formal learning in schools, for the most part, has been structured around the notion that knowledge may be directly transferred from teacher to students. (p. 75)

In examining a historical overview of school design in the United States, Lippman noted that prior to the industrial period the schools that were built clearly reflected the emphasis of learning through rote activities in which students acquired knowledge that was dispensed by the teacher (p. 76). Unlike the country unfolding as a democracy, school facilities when constructed, as Lippman suggested "reflected a less egalitarian approach to teaching and learning" (p. 76). Bearing close resemblance to church facilities, the typical one-room schoolhouse featured an elevated teacher's desk at the front of the classroom with the student's desks placed in rows facing forward toward the teacher.

As the Industrial Revolution, from 1830 to 1890, in response to rapid advances in technology, was largely guided by what Lippman (2010) described as, “the notion of *efficiency*, which strongly influenced the design of factories and school buildings” (p. 76). As the need for larger educational facilities emerged, Lippman suggested that “Regrettably, the notion of efficiency that guided the factory model was also employed in the design of school buildings” (p. 77). A single teacher responsible for the instruction of, in some cases, several hundred students would have to rely on the assistance of older and more proficient student monitors to work with groups of younger students. As seen in the Lancaster school floor plan, even though a much greater number of students were housed in the room, instruction remained focused on specific points of instruction. The influence of the one-room schoolhouse was still very evident. As Lippman again noted, “this instructional approach was created for efficiency” (p. 77), and it is therefore easy to recognize the influence this mindset had on the design of the facility, or as Lippman considered, “reflexive in execution” (p. 76).

The Progressive movement in education, from 1890 to 1945, was identified by Lippman (2010) as “responsive in idea and reflexive in execution” (p. 78). As Lippman noted, the Progressive era viewed students as active participants in extracting knowledge from the social and physical experiences of their world (p. 79). At a time when the education system was struggling to forward with curriculum reforms, school design was being standardized to accommodate the influx of new students due to a growing immigrant population. As Lippman concluded:

These design schemes addressed the functional need to build numerous schools on a variety of sites; however, the design approach used was reflexive. ...While

technologies and building systems were integrated, the places that were created were merely enhancements of the one-room schoolhouse. (p. 81)

In doing so, architects continued to develop facilities that were better suited to support passive learning.

Lippman (2010) also highlighted the exemplary characteristics of Crow Island School constructed in 1939. As Lippman concluded, “The educational planners of this school embraced a responsive design approach” (p. 82). The Crow Island facility understood and embraced the concepts of curriculum reform and successfully incorporated their principles into the design of the school. As Lippman suggested, unlike so many other schools developed during the Progressive era, “The physical environment was treated by designers as *active*, supporting progressive ideas not only for teaching, but for learning as well” (p. 83).

Moving forward into the modern era, from 1946 to 1979, Lippman (2010) concluded that the proliferation of prototype school designs was:

resistant, since it subscribed to reproducing places that (1) reinforced passive learning, (2) institutionalized the notion of the one-room schoolhouse by providing a place with numerous classrooms adjacent to one another to educate large groups of students, and (3) provided an environment that alienated students and teachers alike. (p. 84)

The need for rapid construction of school facilities led, as Lippman observed, to restrictive designs without regard for the educational process. Few, if any, of the pedagogic reforms taking place in the educational system were incorporated into this generation of buildings. Even though new examples, such as the finger plan (Figure 8)

emerged during this time frame, Lippman suggested that they did little to “advance ideas about learning environments as places where the building assists the teacher in providing information and students in acquiring knowledge” (p. 84-85).

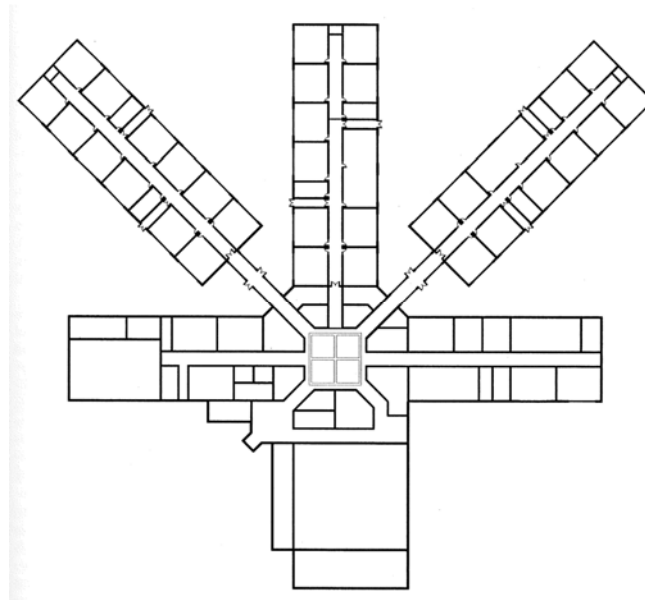


Figure 8. Finger plan (Lippman, 2010, p. 85).

Note. From *Evidence-based design of elementary and secondary schools: A responsive approach to creating learning environments* (p. 85), by P. C. Lippman, 2010, Hoboken, NJ: John Wiley & Sons.

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Even though the postmodern era, from 1981 to 2000, demonstrated evidence of further changes in teaching methods, Lippman (2010) suggested that, “the places that were designed and built, in general, do not assist administrators, teachers, and students in pursuing their activities. Instead the users adapt to the spaces” (p. 89). In a more critical observation of architects, Lippman concluded that, “design professionals have limited knowledge of what really occurs in these settings. In general, in terms of overall design,

schools are considered as static entities rather than as places that mediate the dynamic transactions that occur within them” (p. 89).

As a result, we have moved into the 21st-century trapped in schools that have little basis in the understanding of how people acquire knowledge. As Lippman (2010) noted, designers continue to implement standardized school designs that are assumed to support the needs of students (p. 95). In outlining recommendations for addressing the needs of 21st-century learners, Lippman suggested that the design of learning environments must, “Result from a planning/design process involving all stakeholders” (p. 95). As Lippman concluded, “Even when research indicates that people learn from their transactions with others and with their environment in real-life, authentic situations, the planning of schools continues to follow a resistant, reactive, or reflexive approach” (p. 96). The foundation for the design of better school facilities begins with a better understanding of both the student and their learning environment.

The Need for Facility Improvements is Well Documented

The need for school facility improvements in the United States is well documented. The 1995 General Accounting Office report (as cited in Roberts, 2009) “documented the extensiveness of the deferred maintenance deficits” (p. 368). Unfortunately, since then spending on necessary repairs has decreased. Given the pattern of school facility spending in the United States, Roberts suggested, “the lack of adequate investment ensures that the inevitable process of continued deterioration will continue” (p. 368).

In an effort to fulfill a congressional mandate, the U.S. Department of Education, National Center for Education Statistics (NCES) is charged with collecting, analyzing,

and reporting key data regarding education in the United States. In their NCES report documenting the condition of America's public school facilities, Lewis, Snow, Farris, Smerdon, Cronen, and Kaplan (2000) indicated key findings from the data collected using NCES' Fast Response Survey System (FRSS). Lewis et al. indicated that three-quarters of schools needed funding for "repairs, renovations, and modernizations to put the school's onsite buildings in good overall condition" (p. iii). When identifying the cost of the work on a per pupil basis, the estimated cost was reported at \$3,800 per pupil. The results of the 1999 FRSS survey also indicated that approximately two-thirds of public schools had developed long-range plans that included plans for major repairs or additions to their facilities. Lewis et al. also concluded that "about a quarter of the schools reported that at least one type of onsite building was in less than adequate condition" (p. vii), and even though many schools are in adequate condition, "a substantial number of schools are in poor condition, and some of them suffer from age and overcrowding. Past experience suggests that correcting these problems will be costly" (p. vii). Given the magnitude of the problem, and the significance of the investment required to address the situation, it is key to better understand the changes needed in the physical environment to maximize the impact of facility improvements.

In the United Kingdom, efforts to create world-class 21st-century schools have led to an intense focus on the physical environment of newly constructed facilities. As Woolner, Hall, Higgins, McCaughey, and Wall (2007) indicated, "over the past half century, a range of studies have been conducted, particularly in the USA, which have relevance for this problem of determining what elements of environment cause what effects on learning" (p. 48). In reviewing the body of recent literature examining the

impact of learning environments, Woolner et al. concluded that the evidence could be summarized dividing the impacts into headings of attainment, engagement, affect, attendance, and well-being (p. 49). Within each heading Woolner et al. indicated support of specific physical characteristics having a positive or negative effect on learners.

Unfortunately it is difficult to reach firm conclusions regarding the impact of individual physical elements within learning environments. As Woolner et al. (2007) suggested, “beyond the necessity of meeting basic standards, there is not enough evidence to give clear guidance to policy makers on how to set priorities for funding, or to evaluate the relative value for money of different design initiatives” (p. 60). Even when research may indicate the impact of a single physical element within the learning environment, Woolner et al. noted:

There are a small number of environmental improvements which are associated with improvements in attainment but it is important to remember that once provision reaches reasonable standard, the complexity of environmental interaction comes into play. It is difficult to come to firm conclusions about the impact of learning environments because of the multi-factorial nature of environments and the subsequent diverse and disconnected nature of the research literature. (pp. 60-61)

Despite the difficulty in the weighing the evidence regarding the potential benefits of environmental improvements, we must continue to examine the research. As Woolner et al. concluded, “The key message for policy makers from this review is that considered and targeted environmental improvement is worthwhile” (p. 63).

Importance of the Physical Environment

The condition and environment of a school facility can have a profound impact on the morale and attitude of teachers and students. In order to make appropriate decisions regarding facility improvements, it would seem appropriate for design professionals to take input from all stakeholders. Further research to determine how to evaluate the needs of faculty and student input seems critical to the success of new and improved schools.

Dawson and Parker (1998) presented the findings from a study conducted in 1996-1997 at recently remodeled Neville High School (Louisiana). In order to determine the effects of the facility improvements on faculty morale, comments were obtained from ten teachers. Additional data included direct observations, participant observations, and document review. As a result of their study, and even in spite of the many negative comments expressed by the study participants, Dawson and Parker maintained their original belief that the morale of teachers had been elevated by the renovation (p. 20).

Dekal (2002) sought to identify the previous research findings regarding the impact of the physical components of an enriched learning environment, and understand the factors impeding implementation of these known strategies to improve learning environments. Dekal's methodology included literature research to first "gather information and data on the physical components of the enriched environment which influence learning" (p. 8). An expert panel, consisting of eighteen members representing a broad level of educational experience and training, was then polled utilizing the Delphi process to identify the "top five factors which impede implementation of enriched educational environments" (p. 9). The Delphi process was then used to also develop a top five strategies for successful implementation.

One of the conclusions Dekal (2002) identified was the need for the education and training of stakeholders regarding both the obstacles to enriched educational environments, and the strategies for overcoming them (p. 153). It was also suggested that further research should be conducted to determine “student preferences of learning environment needs” (p. 155).

Buckley, Schneider, and Shang (2005) attempted to build on literature and research suggesting that the quality of school facilities was an important factor in teacher retention within schools in the Washington, D.C. public school system. The first argument posed was that the quality of school facilities is an important factor in an individual teacher’s decision to remain within the teacher profession, and perhaps even to remain within a specific school building. The authors also believed the literature would be “particularly applicable in large, urban school districts like Washington, D.C., in which facility quality is often poor” (Buckley, Schneider, & Shang, 2005, p. 1108). Their review of literature regarding teacher attrition indicated findings relating to school facilities including, the importance of a teachers ability to control classroom temperature, the availability of adequate natural daylight within the learning environment, and classroom acoustics.

The second argument Buckley, Schneider, and Shang (2005) posed was the effect of facilities on teacher retention, even when isolated from the other variables affecting teacher attrition. Data from Buckley, Schneider, and Shang’s spring 2002 survey of Washington, D.C. teachers indicated a “statistically significant coefficient for the effect of facilities grade on the decision to stay. As the perceived quality of the school facilities improves, *ceteris paribus*, the probability of retention increases” (p. 1115).

It would appear that teacher attrition is most likely an indicator of job dissatisfaction. This could also indicate a link between job satisfaction, prior to departure, as having an influence on teacher performance. If teacher performance is impacted by facilities, it seems likely that it also has a corresponding impact on students. The impact seems possible in two ways, first directly as a result of poor facility conditions, and secondly as a result of dissatisfied teachers.

Shortfalls in educational budgets often force school administrators to choose between the designation of funds for teachers and teaching materials, or facility needs. Buildings are often presumed to take disproportionate funds without having a direct relationship to the learner (Earthman & Lemasters, 1998, p. 5). Earthman and Lemasters determined that given the weight of research supporting the impact of facilities on student achievement, the funding in the State of Virginia for maintenance of school facilities was inadequate. Further study also indicated, that the shortfall in the funding for new school facilities was not exclusive to the State of Virginia. As Earthman and Lemasters observed, “There are approximately thirty-three more who follow such a funding pattern, leaving the place where the student learns as a less than high priority item in the state budget” (p. 14). When, and if, spending priorities shift, Earthman and Lemasters concluded that “designers and educators need to become knowledgeable about the data from the research” (p. 14). In other words, as funds are made available for school construction, designers must become more capable of incorporating the available research for the benefit of students.

Earthman and Lemasters (2009) also conducted research that was intended to investigate whether the attitudes teachers have about the condition of their classroom

plays a role in job satisfaction, and even the decision to leave the teaching profession. The My Classroom Appraisal Protocol© (MCAP) was used in eleven high schools to gather data. Earthman and Lemasters indicated that the physical environment influences the attitudes of teachers and also has a corresponding impact on teacher productivity. As Earthman and Lemasters suggested, “School authorities need to recognize the importance physical conditions have upon teachers so that feelings and attitudes do not pervade the faculty” (p. 323). Even though, as Earthman and Lemasters observed, “teachers and students tend to compensate for unsatisfactory conditions and limited resources” (p. 324), ultimately there is an impact on how well students learn.

As Earthman (1998) observed, even though “Conventional wisdom in the area of educational facility planning and design seems to indicate that the physical environment does indeed have an effect upon the behavior and performance of the students and teachers who occupy these spaces” (p. 4), there is difficulty in demonstrating a statistically significant relationship. Does the physical environment create a significant distraction for teachers, ultimately leading to an impact on the achievement of their students? Earthman suggested benefit in further study of the role facility conditions play in the morale of teachers. As Earthman concluded, “In almost all cases, the better the built environment is, the more positive the impact on students” (Abstract section, ¶ 1).

Taylor (2000) outlined an integrated model for addressing school facility design and curriculum integration, the School Zone Design Model (SZDM). The SZDM encompasses the concept that a learning environment makes a difference in, and contributes in a direct way to student behavior and learning. Understanding the

relationship between education and architecture within these areas should be utilized to make programming and design decisions.

Taylor (2000) reviewed seventeen case studies to illustrate the outcomes possible when SZDM principles are incorporated into the design and programming of educational facilities. Four observations were extracted from these case studies.

1. Communities must design ways to identify and include all stakeholders in the programming and design of educational facilities.
2. Community members must develop an understanding of design principles in order to effectively participate in the programming and design process.
3. Communities must embrace an image of children as strong and capable learners who are hungry for learning opportunities.
4. The planning and design efforts of architects and educators can become a valuable tool for presenting the purpose of school facility initiatives to the community. (pp. 38-45)

Taylor (2000) presented a strong link between the programming and design of educational facilities and the ability of learners to benefit in tangible ways from the proper integration of educational context, content, and learning processes within the architecture. Taylor also suggested that further research, including “the analysis of school sites using multiple voices as compared to research findings of a quantitative nature” (p. 45), could ultimately benefit the design process used for the design of school facilities. As Taylor concluded, “Most often, no one has considered asking for direct meaningful student input when planning new or renovated school buildings” (p. 45).

The Impact of Facilities on Student Achievement

Bowers and Burkett (1987) presented findings indicating that students can be affected in positive or adverse ways by the visual, acoustical, and thermal characteristics of the classroom environment. Their study included fourth and sixth grades students in two separate school facilities: one an older 1939 facility housing 584 students, and one a newer 1983 facility housing 758 students. The reading, listening, language, and arithmetic scores of students in the newer facility were found to be much better than those of students in the older facility. Bowers and Burkett also indicated better records in the areas of health, attendance, and discipline among the students of the newer facility as compared to the students of the older facility. “Analyzed data revealed that, in every case, a significant difference existed between students at the two elementary schools in regard to the relationship of the physical environment and student achievement” (p. 14.).

Holloway (2000) outlined a sobering assessment regarding the condition of school facilities in the United States. As Holloway noted, the Government Accounting Office 1996 report (as cited in Holloway), indicated that about one-third of the school buildings are in need of extensive repair or replacement. “About 25 million students nationwide attend schools with at least one unsatisfactory environmental condition” (p. 88). Coupled with the compelling research on the important role facility play in student achievement, it seems imperative to spend future dollars wisely and effectively.

Uline and Tschanne-Moran (2008) sought to confirm a link between the quality of school facilities and student achievement. Seeking to further more than four decades of research that provided a link between school climate and student achievement, their study examined the correlation between the quality of facilities, resource support, school

climate, student socio-economic status (SES), and student achievement. Their goal was to determine if school climate had a mediating influence on student achievement.

Teachers from 80 middle schools in Virginia were surveyed to obtain the data regarding the quality of facilities, resource support and school climate. Data on student achievement was obtained using eighth-grade Virginia Standards of Learning (SOL) tests. To determine socio-economic status, data regarding the proportion of students receiving free and reduced-price lunches was obtained from the Virginia Department of Education.

Uline and Tschanne-Moran (2008) confirmed “that school climate plays a mediating role in the effects of the quality of school facilities and student achievement” (p. 55). One of the primary implications Uline and Tschanne-Moran reported is that “the manner in which a school building is designed, managed, and maintained sends a message to its occupants and the community beyond, speaking volumes about the value placed on activities transpiring within its walls” (p. 67). In addition, Uline and Tschanne-Moran also suggested that “When students feel comfortable to move within and beyond their individual classrooms, chances are they will engage more actively in their own, and each others, learning” (p. 68).

Uline, Tschannen-Moran, and Wolsey (2009) sought to build on earlier findings from the Uline and Tschannen-Moran (2008) study. It was a qualitative study designed to explore the influence a school’s physical properties have on teaching and learning. Two schools, although different from one another, shared common factors in quality of facilities, student performance, low socio-economic conditions, teacher professionalism, and emphasis on academics. Researchers interviewed teachers, parents, administrators,

support staff, and students utilizing individual, focus group, walk-through and photo-documented journals. Uline, Tschannen-Moran, and Wolsey revealed a link between specific building features and student achievement. Design features such as personality of space, themes related to building quality, movement, aesthetics and signature features, comfortable and welcoming appearance, flexible and responsive classrooms, play of light, elbow room, and security all contributed to positive student behavior and learning.

After teaching experiences in both older and brand new facilities, Bishop (2009) noted a “perceptible difference in feeling among students and staff in a new building compared to that noted in an older building” (p. 1). Bishop’s perceptions regarding the impact of new facilities led to research intended to measure the impact of new facilities on the behavior of both students and staff. This qualitative case study utilized principal interviews and focus group interviews at three recently completed new high schools in Virginia. The purpose of the research was to identify the perceptions of the principal, students, and staff at each facility regarding the impact of specific design elements on improved student attitudes and behaviors.

Bishop (2009) indicated three emerging themes from this study: (a) a belief on the part of principals and staff that student behaviors improved in their new facilities in comparison to previously occupied older facilities, (b) morale and attitude improved among both students and staff in the newer facilities, and (c) an interesting belief on the part of both principals and focus group members that the newer facilities did not have a more positive impact on student achievement than the older facilities.

Recognizing that previous quantitative studies show the opposite conclusion regarding the impact of new facilities on student achievement, further research seems

appropriate to better understand the perception of administrators and staff regarding new facilities. If their perceptions regarding completed facilities are inaccurate, perhaps their input and decisions during the design process is also flawed.

Hughes (2006) conducted research to determine if a relationship existed between building design characteristics and the Texas Assessment of Knowledge Skills (TAKS) scores of elementary age children in an urban Texas school district (p. 4). The research was a descriptive study, utilizing the Design Assessment Scale for Elementary (DASE), and TAKS to determine if a relationship existed between the DASE score and the school's state rating (p. 6) Hughes outlined several key recommendations as a result of this research (p. 62):

1. Facility planners and decision makers need to develop a mechanism for teachers and principals to be more involved in the planning process.
2. Decision makers need to be updated on the current research to enable better decision making and more effective use of funds.
3. Which speaks directly to my area of intended research, "Educators need to have a greater voice, take a united stand, and demand facilities that promote greater student achievement" (p. 63).

There have been many studies showing the connection between the condition of school facilities and educational outcomes. "This study proposed that one reason why previous research regarding the effects of the physical school environment on educational outcomes has had little impact on the quality of schools is because there is a lack of knowledge about these relationships" (Bosch, 2003, p. 1). Three primary obstacles to utilization of the findings were identified as: (a) lack of knowledge, (b) unawareness on

the part of decision-makers, or (c) decision makers who are familiar with the findings yet choose to ignore them. Bosch initially conducted a literature analysis to understand the objectives of school facility researchers. Secondly, a concept mapping methodology was utilized to interview educators to develop a “list of measures of student, school, or school district success” (p. 1). Bosch also utilized these findings to develop a set of priorities for further research.

Bosch (2003) indicated a need for coordinated efforts between researchers and educational decision makers. Bosch also suggested that one of the obstacles to implementing change in the design of educational facilities is “poor communications between researchers and practitioners” (p. 2). In spite of the findings available, there seems to be a disconnect between the discoveries regarding the importance of the physical environment, and the ability of school facility designers to incorporate findings in a way that results in better schools. As Bosch concluded:

If School Facility Effects researchers are to have a greater impact on the types of schools that are built and how they are operated, it is imperative that they continue to strive towards providing information that will directly assist school decision-makers and designers. (p. 11)

Better school facilities will be the result of: (a) more effective research, and (b) design and educational professionals who are better informed about the variables affecting educational outcomes.

Crook (2006) sought to determine if a relationship could be drawn between the condition of educational facilities and the percentage of students passing the Standards of Learning (SOL) examinations. As Crook noted, “Recent educational reform has placed a

high emphasis on standardized test scores and instructional change without mentioning the relationship between the educational facility and student achievement.” (p. 4). The data components used to form this study were: (a) the percentages of students passing the SOL examinations in the high schools in Virginia, (b) response of principals to the Commonwealth Assessment of Physical Environment (CAPE) assessment, and (c) the percentage of students participating in the free and reduced lunch program as measure for determining the Socioeconomic (SES) status within the study. After factoring for SES, the study indicated that students attending schools receiving substandard CAPE results scored significantly lower on SOL examinations.

Crook (2006) further indicated a direct correlation between facility conditions and student achievement. Since improved facilities contribute to academic achievement, the need for appropriate input from teachers and administrators in the design process of school facilities takes on a significant role. The understanding and communication of student needs between the parties involved in facility designs seems critical to the desired outcome of the project.

United States continues to spend over \$20 billion annually to remodel and replace outdated school facilities. How much of the money spent actually improves learning? “Politicians, school officials, and school designers often proclaim that new schools will raise student achievement, but they’re hard pressed to explain how or why” (Black, 2007, p. 40). Hill (as cited in Black), whose company specializes in school facilities, stated “schools should never be judged by a pleasing appearance, ... Architects and school officials should design schools that ‘measurably and sustainably’ increase fair and equitable learning opportunities for all students” (p. 39).

If adult school designers are working with adult school administrators, and adult teachers to gain insight regarding school facilities, is there any certainty that they will produce child-centered solutions? This suggests the need for better understanding of the motives behind school facility design decisions, and an effort to determine if they truly represent the needs of 21st-century learners.

Mixed or Opposing Views Regarding Facility Impact

It is important to recognize that at least some research literature (Picus, Marion, Calvo, & Glenn, 2005; Roberts, 2009) has shown mixed, or even the opposite, conclusions regarding the impact of new facilities on student achievement. Further research seems appropriate to gain a better understanding about the perception of administrators and staff regarding new facilities. If the perceptions of principals and teachers regarding completed facilities are inaccurate, perhaps their input and decisions during the design process are also flawed.

As the demand for increased funding to address school facility conditions rises, the importance the facility condition plays in the learning process must be better understood and communicated. Picus, Marion, Calvo, and Glenn (2005) surmised that Wyoming offered a “unique opportunity to more accurately study the relationship between school facilities and student performance” (p. 80). Responding to court rulings in the *Campell v. Wyoming* case, the state implemented an adequacy-based school funding system. This resulted in the development of a state-wide facility assessment indicating a \$563 million price-tag to bring schools within the court mandated facility requirements. Even after assessing the improvements that were made to Wyoming school facilities, Picus et al. were not able to draw a correlation between the facility

improvements and improved Wyoming Comprehensive Assessment System (WyCAS) test scores (p. 88). Picus et al. suggested that their findings should not be used to conclude that investments in school facilities were unimportant. Given the limited resources available for school facilities, it is even more critical to gain a better understanding of stakeholder perceptions regarding the value of design decisions before they are implemented.

As Roberts (2009) noted, one of the primary motivators for funding school facility improvements is the presumed link between facility conditions and student achievement. However, Roberts began by observing:

The research literature connecting facility conditions to student outcomes is mixed, with findings ranging from no effects to substantial ones. The ambivalence of such evidence makes the case for investing in facility conditions harder to sustain against competing investment opportunities. (p. 369)

Roberts concluded that the evidence connecting the physical environment to student achievement was more suggestive than definitive. From Roberts' perspective this did not however suggest a dismissal of the attention to the importance of the physical learning environment. Instead as Roberts suggested, it indicated that "There is clearly much room for more systematic conceptualization and measurement of how school facilities should be measured from an educator's perspective" (p. 378).

The Impact of Facilities on Student and Staff Behavior and Attitudes

Hickman (2002) investigated the impact of new high school facilities on student behavior and staff attitudes in thirteen selected Ohio schools. The new facilities represented a diverse sample of rural, small city, suburban high schools. Data collection

was obtained through surveys completed by superintendents, high school principals, assistant high school principals, and high school guidance counselors.

In conclusion, Hickman (2002) identified the four key groups used in this study as “a fairly good cross section of individuals who have “the pulse” of what goes on within their respective school systems” (p. 130). However, Hickman also indicated superintendents struggled to answer questions regarding student attitudes and behavior, going on to suggest an appropriate revision to this study “would be to include students’ or community residents’ survey responses and perceptions regarding fellow students” (p. 127).

Building on the platform of research supporting the link between school climate and student achievement, Lee (2006) conducted this study through quantitative research to examine the specific impact of new school facilities on school climate. The purpose of the study was to draw a “construction-to climate-to educational outcome” (p. 55) conclusion. Teachers, paraprofessionals, support staff, administrators, and professional support personnel from sixty-seven Gloucester, New Jersey schools completed the *Charles F. Kettering School Climate Profile* in an effort to compare their perception between prior old facilities and newly occupied facilities. Lee’s study indicated a direct correlation between new facilities and the perception of staff regarding school climate.

Lee (2006) also suggested further research regarding the importance of leadership on the construction of new school facilities. Involving the proper individuals in the design process seems to be critical to the success of the completed project. Decisions that impact the physical environments created to house teaching activities should clearly address the

needs of all occupants, including those of the majority stakeholders. Those leading the process must be certain that they include the voice of students.

Student and Teacher Response to Physical Characteristics

In contrast to dramatic changes in educational delivery, new facilities are being designed and constructed with little change from the outdated designs of the past. The fear of real or perceived failures seems to inhibit the decision making process. Take for example the open space schools that emerged during the 1970s. While labeled by many educators as failed experiments, others would suggest they were in fact a success when properly utilized. As Ahrentzen and Evans (1984) indicated:

New practices in school design, such as open space schools and classroom lofts, have been implemented in recent years. Unfortunately these innovations frequently engender concerns about the suitability of these design innovations for classroom study. For example, critics of open space schools claim that excessive noise and visual stimulation of open space schools have adverse, distracting effects on students. (p. 438)

The purpose of their study was to “discover whether particular classroom environmental features influence distraction, privacy, and general satisfaction for students and teachers” (p. 440). While the impact of environmental influences on distraction was found to be prominent among teachers, few architectural features were found to affect student distraction.

In summary, Ahrentzen and Evans (1984) indicated “it is clear that students and teachers respond differently to classroom design features” (p. 450). They further suggested that:

Classroom innovation, however, is not the sole property of the architect. Students and teachers can become more involved in creating and changing their environments . . . If researchers can eventually develop a working taxonomy of important classroom design features that influence user behavior and satisfaction, then we can aid others in intervening in the design of classroom spaces intelligently. (p. 452)

Recognizing the differences in student and teacher responses suggests a clear need for involvement of both parties in the design of new facilities. To determine whether teachers provide adequate insight into the needs and preferences of students during the design and programming of new facilities deserves further research.

Purpose Based Evaluation

Roberts (2009) conducted research to “illustrate a simple but important point; namely, that how we measure school facilities has important consequences for what is observed” (p. 378). Roberts observed that the primary focus of research measuring the condition of school facilities in North America relies on “an engineering perspective” (p. 369). Rather than relying on research measured from an engineering perspective, Roberts suggested the importance of building “the case that it is essential to take the purpose of facilities into account when considering their connection to learning outcomes” (p. 369). Rather than relying on the use of a “property-management perspective” (p. 370), Roberts indicated the need for developing a method of purpose-based evaluations.

Roberts (2009) conducted testing comparing the results of a commonly utilized Facility Condition Index (FCI), and an instrument called the Commonwealth Assessment

of Physical Facilities (CAPE). Unlike the FCI assessment, the CAPE provided a measure of descriptive and evaluative measures. Roberts concluded:

The evidence illustrated in this report suggests that property-management measures of school facilities provide few clues to the learning environments in schools . . . On the other hand, it appears that measures that use an educators' perspective on school facilities do have reliable relationships to learning environments. (p. 378)

In summary, Roberts suggested that if FCI assessments were the only factors utilized to drive facility improvement decisions, limited support would be attainable. "There is clearly much room for more systematic conceptualization and measurement of how school facilities should be measured from an educator's perspective" (p. 378).

As Roberts (2009) indicated, "the mission-relevant aspects of school facilities are the conditions that should be given primary consideration when examining the importance of school facilities educational outcomes" (p. 372). There is certainly evidence to suggest the importance gaining a better understanding of the educator's role during the design and programming phases of school facilities. It also supports the need for a greater understanding of both teacher and student perceptions regarding the learning environment.

Classrooms Must Begin to Reflect Changes in Education

The changes in teaching methods are well documented, but are our facilities changing along with them? As Cornell (2002) suggested, "The industrial era begot an educational environment that has been in place since the late 1800s. That era passed years ago, but we are struggling to shake free of its legacy. It is time to move on" (p. 34). In

order to provide a quality learning environment, architects must develop spaces with the needs of users in mind; or, as Cornell outlined, follow the principles of *user-centered* design. “The essence of the idea is that the needs of the end user should constantly drive design... we need to be concerned with two kinds of users – instructors and learners” (p. 35). Quality learning environments should then take shape through user-centered principles by providing (a) comfort, safety, and health, (b) usability, (c) psychological appeal, and (d) functionality.

While addressing critical infrastructure needs, most school remodeling projects create little if any change in the physical layout of the facility. In many cases few, if any, changes are made to the composition of the learning environment. New schools are also constructed each year to replace outdated and aging facilities. Unfortunately, despite the dramatic changes taking place in education, most new school facilities lag far behind in their innovation.

This is an intensely active time in school construction, and yet schools are built or renovated every day without input from students. Architects design monuments to themselves instead of places to support learning and curriculum. Educators occupy environments and use equipment they don't fully understand and can't exploit to the fullest. Children learn to tune out the environment rather than develop awareness and a sense of belonging. (Taylor, 2000, p. 5)

Understanding the relationship between education and architecture within these areas should then be utilized to make programming and design decisions. The desired outcome of the process is an educational facility that is designed as an active learning tool.

In conclusion, Taylor suggested:

The instructional delivery system of schools is changing, and past models do not reflect the impact of technology and the information highway on the use of space in schools by both teachers and students, let alone community. In fact, classrooms as we know them today may be eliminated entirely in the future. At the very least they must be configured differently now that roles are changing. (p. 46)

Architects must recognize these changing roles and avoid simply perpetuating school facilities based on isolated individual classrooms along double-loaded corridors.

Statistics from a 1999 report by the National Center for Education Statistics (NCES) (as cited in Taylor, 2009) indicated that the average school facility in the United States is 40 years-old. As school buildings continue to age, it is clear the need for facility improvements will remain a pressing need for the educational community. It is also, as Taylor suggested, a call to action: an opportunity for an innovative approach to school facility programming.

It would be a tragedy to compound the problem of inadequate facilities by repeating outmoded designs that are unsafe, do not apply to the latest educational theories, and fail to support sustainable, ecologically good design. Our children deserve schools that give them a sense of dignity, worth, and freedom. (p. 8)

In order to achieve these results,

Architects and educators must understand each other and develop a shared vocabulary encompassing educational theories, developmental requirements of growing children, aesthetic theory, and practical issues in designing schools. Our children will reap the rewards of this integrated approach when they are able to

occupy spaces designed expressly to stimulate their natural curiosity, where architecture is not a vacuous space but a learning tool. (p. 3)

It is in everyone's best interest to develop a greater understanding of the impact educational facilities have on the academic success of children, and begin to design new facilities with a better understanding of the changing needs of students by involving them directly in the process.

Most architectural programs for school facilities are developed using predetermined needs and baseline technical requirements such as square footages or standardized educational specifications. Taylor (2009) pointed out, however, the unfortunate tendency is for programs to “bog down with budgets or value engineering before achieving higher-order values such as curriculum, enduring usefulness, beauty, or sustainability” (p. 5). The author further suggested “a call for more empirical data and corresponding medical research to support new findings in education” (p. 13). As research continues to show evidence of the link between school facilities and student achievement, “how much more time will pass before educators and designers translate this information into positive action” (p. 13)?

Taylor (2009) suggested a parallel emphasis be developed between the insights taken from developmental psychology and the enduring definitions of architecture as identified by a first-century Roman, Vitruvius. This relationship was used to form an illustration labeled “Holistic Goals of Educational Facility Design” (p. 6). The illustration suggested three parallels be considered in order to align the goals of education with the goals of architecture. “From these humble parallels of body/structure, mind/function, and

spirit/beauty, we begin to see the types of questions we must ask before we design educational facilities” (p. 6). The questions emerging should then fall along three lines:

1. What building systems will facilitate physical learning?
2. How can the designed spaces be developed to support the mind?
3. What components or elements of the design will bring stimulus to a child?

(p. 6)

Following these lines in a collaborative spirit should help architects and educators develop new or renewed facilities which are better equipped to meet the needs of 21st-century learners.

Value in Consulting Pupils

As Flutter and Rudduck (2004) noted, “until recently there have been few attempts to involve pupils as active participants in classroom-based research investigations and school improvement initiatives” (p. 4). But can it really add value to include students in our efforts to reform education? As Flutter and Rudduck suggested:

The answer is, perhaps, an obvious but often overlooked one: to find new directions for improving schools we must take as our starting point the classroom itself and explore teaching and learning through the eyes of those most closely involved – teachers *and young learners* [italics added]. (p. 2)

While cautioning against placing too much weight on pupils’ perspectives, Flutter and Ruddock noted that “research leads us to believe that practitioners and schools can benefit from tuning into pupils’ perspectives” (p. 3). The evidence clearly suggests the ability of pupils to suggest ways to improve classroom layouts, seating arrangements, and a variety of other physical characteristics within the learning environment.

The traditional methods for achieving pupil involvement have followed what Flutter and Rudduck (2004) suggested are passive forms of engagement, where pupils are “regarded as ‘consumers’, or even ‘products’, of educational provision rather than as active participants in a learning community” (p. 14). As Flutter and Rudduck observed, once the decision to involve students begins, it is likely to evolve in different ways (p. 15). In an effort to describe the evolution of pupil consultation, Flutter and Rudduck outlined a “ladder of pupil participation” (p. 16), each rung on the ladder of participation providing further engagement. Ultimately students move up the ladder from an initial point of no involvement to a final rung where “pupils are fully active participants and co-researchers” (p. 16). As Flutter and Rudduck concluded, “involving pupils in discussion about teaching and learning” (a) enriched students, (b) provided teachers with valuable feedback on ways to improve teaching and learning, and (c) gave schools valuable direction for school improvement planning (p. 21).

As Flutter and Rudduck (2004) concluded, “the pupil voice offers a different path for the future development of education” (p. 138). While the efforts to consult pupils present new challenges, the benefits of engaging users seem to outweigh the risks. As Flutter and Rudduck suggested, “The transformative potential of pupil participation will be lost if established structures within schools prevent this movement from taking root and flourishing” (p. 138).

Importance of Engaging Users

In an effort to establish a framework for evaluating educational spaces, the Center for Effective Learning Environments (CELE) indicated “the importance of engaging with the users of learning environments and other stakeholders to enrich understanding of

how, and how effectively, environments support educational and other objectives” (von Ahlefeld, 2009, p. 1). As von Ahlefeld indicated, although evaluating quality in the learning environment is challenging, CELE has identified two broad policy criteria: (a) “capacity of the space to increase access and equity to education” (p. 2), and (b) “capacity of the space to improve educational effectiveness and promote acquisition of key competencies” (p. 2).

If students are to realize a greater impact from new school facilities, they must receive adequate representation during the design process. As suggested by the CELE (2009):

It is perhaps self-evident that if students are central to learning and the mission of schools, then they would have a lot to say about their school environments.

However, the call to ‘listen to student’ in the Future Scotland Debate suggests that it still does not happen. (¶ 2)

As Abend et al. (2006) indicated, “case studies show that involving multiple stakeholders... in the design, planning, and management of educational spaces can have a positive impact on student motivation and educational outcomes” (p. 12). In order to realize improved learning environments, evidence suggests that students deserve a greater role during the design process.

Burke and Grosvenor (2003) suggested that children and young people are capable and entitled to help shape school facilities. The authors concluded that “if schools are to be a successful vehicle for learning in the twenty-first century, it is essential that young people are involved in determining their nature, design, organisation, ethos and use” (p. 9).

Under the Building Schools for the Future program (BSF), the United Kingdom is in the midst of a £21.9 billion funding plan to refurbish or rebuild all secondary schools by 2021. As Newman and Thomas (2008) noted, “one of the requirements of the scheme is student involvement. However, little guidance is provided for exactly how involvement or consultation should take place” (p. 237). Their paper reported the initial research findings from a case study conducted by teams from Coventry University, University of Northampton, and Keele University. As part of an Arts and Humanities Research Council funded project, ‘Realizing participatory design with children and young people: A case study of design and refurbishment in schools’, researchers intended to establish “the extent to which children and young people are involved in the design of their new schools and to ascertain the effectiveness of strategies adopted by a set of case study schools” (p. 237).

Drawing from recent the research findings, Newman and Thomas (2008) suggested that “children are competent and active members of society, who can and should have a say in aspects of social life that concern them” (p. 238). Despite historical doubts of the ability to obtain meaningful input from children and young people, new discoveries challenging these assumptions support the direction of the BSF process.

Students are being given a specific voice. As one school minister noted:

It is clear that new schools in which students have had input to the process – not as designers or architects, but as users of the building – are schools where the student body and staff feel real ownership. . . BSF is not something that should be ‘done’ to students and teachers and the local community. It is about them and so they must be a part of the process. (as cited in Newman & Thomas, 2008, p. 239)

The review of design efforts on Park Wood school, a replacement facility being designed to serve the area of Coventry, was observed to determine: (1) the extent of student involvement in the design process, (2) the methods of student participation that were being used, (3) the effectiveness of the methods being utilized, and (4) the mechanisms put in place to “ensure pupil voice was fed into the process” (Newman & Thomas, 2008, p. 240). At the time of their research, the facility was still in the pre-design stage. As Newman and Thomas indicated:

The aims of the research were met by examining the depth and frequency of student participation, attitudes of staff and students towards participation, whether there were any concrete results to student participation, asking students and staff to evaluate the existing methods of participation and whether changes were necessary. (p. 241)

The strategies utilized by school planners to engage students in the design process of Park Wood included: (a) consultation during the visioning process, (b) a ‘Design your school day’ conference, (c) Personal, Social, and Health Education (P.H.S.E.) lessons, (d) student council involvement, and (e) sending home family questionnaires (Newman & Thomas, 2008, p. 241). Newman and Thomas concluded that even though “schools are not provided with sufficient guidance or methods to enable student participation in the design of new schools” (p. 248), staff and students discovered many positive aspects from the process. Overall the study indicated “the capability of young people to comprehend issues that have often been thought too complex for them, or are conceptualized as simply not their concern” (p. 249).

Student Input in Curriculum

The idea of involving students in curriculum development has been gaining momentum for several decades. Tyler (1977) in developing revisions for a book regarding the basic principles of curriculum and instruction started with the premise that we should “now give much greater emphasis to the *active role of the student in the learning process*, and to the implications student involvement has for curriculum development” (p. 11). Tyler suggested that a proper emphasis on the active role of the learner also has “important implications for the selection of educational objectives” (p. 12). Tyler concluded that whenever possible and appropriate, “the students themselves should participate in planning and evaluating the curriculum” (p. 13).

Educators have seen positive results from efforts to involve and empower students even in varied settings. As Reeves (2008) suggested, “The energy generated when students take ownership of their learning is surprisingly similar across different education settings” (p. 84). Reeves observed how two school districts of varied demographics and population sizes shared positive gains when they engaged their students in participating in decisions about everything from cafeteria menus to curriculum.

Educators at the postsecondary level now see the benefits of curriculum reforms that leverage cooperative learning opportunities, specifically those that take place outside the classroom. As Opitz and Hartley (2005) noted, “At the heart of recent developmental education reform, ... are principles of collaboration between instructors and students to achieve learning goals” (p. 396). In studying Academic Resource Centers (ARCs) at the University of Minnesota, Opitz and Hartley concluded that the key to the success of collaborative centers is to focus on the students’ needs rather than instructor preferences.

Seeking the input and feedback from students on details such as the location and layout of the ARCs has led to the design of centers that “interface with academic departments in ways that build coherence within students’ educational lives” (p. 409).

In developing strategies for professional development, evidence suggests the value in gaining a better understanding of student work. Cameron, Loesing, Rorvig, and Chval (2009) examined cases of professional development strategies at two elementary schools involving the use of student work, specifically strategies to solve math problems, as an opportunity “to enhance teaching and learning” (p. 489). In a pivotal moment during a team meeting at one of the schools, teachers exposed their confusion about the variety of strategies students used to solve the same math problems. They ultimately agreed that their teaching methods would be more effective if they better understood the strategies students were using to solve the problems. Without asking for direct input from the students, they were realizing the value of an indirect view from the student’s perspective.

Teachers at the second school ultimately chose to work with their administration to redirect the focus of their faculty meetings. As Cameron et al. (2009) indicated, “Rather than spending time ‘delivering information’ to the faculty, teachers now use that time for professional development centered on student learning” (p. 492). As Cameron et al. concluded, “Using student work enhanced and focused communication among teachers within and across grade levels regarding important mathematical ideas needed to effectively teach mathematics to elementary school students” (p. 493).

User Input in Technology

There have been reports of significant achievements gained from the involvement of children in the development of educational technology, in particular educational software. Druin and Solomon (1996) pioneered the idea of having children as a part of the design team. Druin (2002) outlined a framework for understanding the contributions children are able to make during the design process. As Druin noted:

Children have their own likes, dislikes, curiosities, and needs that are not the same as their parents or teachers. As obvious as this may seem, we as designers of new technologies for children sometimes forget that young people are not 'just short adults' but an entirely different user population with their own culture, norms, and complexities. (p. 1)

Based upon an analysis of existing literature and Druin's own research, four roles emerged for children during the technology design process: user, tester, informant, and design partner (p. 3). Druin concluded that each of these roles "can shape the technology design process and impact the technologies that are created" (p. 4). When given the opportunity to do so, "children can contribute to the technology design process in many valuable ways" (p. 30).

Guha, Druin, Chipman, Fails, Simms, and Farber (2005) indicated that "The techniques of Cooperative Inquiry enable children and adults to work together to create innovative technology for children" (p. 40). In developing the idea of Cooperative Inquiry, Guha et al. extended and refined concepts of participatory design among diverse age groups from pre-school through adolescence. While there was a recognition of limits on the abilities of children to participate effectively, especially those ages four to six,

Guha et al. implemented the *mixing ideas* technique as an effective method for collaboration with young children (p. 40). Guha et al. concluded that intergenerational partnerships can lead to unexpected technology innovations, as well as establishing methods for working with children (p. 42).

As Scaife, Rogers, Aldrich, and Davies (1997) indicated, human-computer interaction (HCI) practices are now thoroughly ingrained in the design process of educational technology and software (p. 343). Scaife et al. described how in a more conventional approach, a user-centered approach places the users in a reacting role to allow designers to “obtain a range of feedback as to what is good, bad and ugly about their designs” (p. 343). The more recently explored alternative of participatory design (PD) seeks to engage users as actual partners in the design process. As Scaife et al. concluded, “Clearly, there is much to be gained from adopting a child centered framework that allows for different kinds of inputs from children.... Children are very good at letting us know what is it that keeps them engaged, which is often not what adult designers or their proxies (e.g. market research) would have expected” (p. 344). Scaife et al. suggested a better “approach to the child-designer relationship for designing interactive learning environments is to position ourselves between the user-centered and participatory design perspectives” (p. 344). Scaife et al. also concluded that the informant design framework “is also generalisable to other domains” (p. 350).

Scaife and Rogers (1999) concluded that research left little question as to the ability of children to make contributions to the design process of children’s technology. “What is less clear is whether we can generalize about the relationship that they can be expected to have with designers” (p. 30). Scaife and Rogers suggested that designers and

educators should continue to ask how to optimize the interactions with children during the design process (p. 30). Scaife and Rogers also concluded that children will, if given the opportunity, contribute to enhanced solutions. The challenge is to understand “when to say yes and when to say no to kids’ ideas” (p. 45).

How Young Can Design Partners Be?

Flutter and Rudduck (2004) indicated that, “Our research with primary and secondary schools across the UK has demonstrated that pupils of all ages can show a remarkable capacity to discuss their learning in a considered and insightful way” (p. 7).

As Flutter and Rudduck also noted:

teachers working on the Effective Learning Project consulted pupils about learning environments and were intrigued to discover a range of things that pupils mentioned as having an effect on their learning... Teachers found these findings useful and were able to plan some changes in their classrooms. (p. 13)

Flutter and Rudduck concluded that seeking input from students would “offer a different path for the future development of education” (p. 138).

After extensive experience leading participatory design teams with 7 to 11 year old children, Farber, Druin, Chipman, Julian, and Somashekhar (2002) set out to study the idea of partnering with kindergarten children, ages 4 to 6, on the development of new technologies. As part of the National Science Foundation’s five-year project called “The Classroom of the Future”, Farber et al. expected their research to provide “a better understanding of the input and devices necessary for children to use technology, as well as methods to effectively design these technologies and use them in the classroom” (p. 2). Over the course of a year of working as partners in two elementary schools, Farber et al.

discovered the importance of first helping the children “understand that they can be inventors of technology who have ideas that matter in the process of creating new technologies” (p. 2). At the conclusion of the project, student journals provided feedback as to their experiences during the design process. As Farber et al. noted, many of the students concluded that they had not only learned how to participate in the design process, but had also “learned how to better use the computer or specific applications on the computer” (p. 3). Farber et al. also concluded “that in fact, young children can work together with adults and function as design partners” (p. 5). While it was clear that specific methods were necessary to include children as design partners, there was clearly value in their participation.

Research Suggests that Teacher and Student Perceptions are Different

Teachers are tasked with a great deal of decision making that is presumed to benefit students. Everything from teaching methods to furniture arrangement falls on the shoulders of educators. But is it correct to assume that all decisions made for the benefit of students really have their intended outcome? After conducting research to explore both teachers’ and students’ perceptions of the impact of learning environment characteristics, Doppelt (2006) concluded that “teachers and pupils have different viewpoints towards the impact of learning environment characteristics upon different learning outcomes” (p. 176). Doppelt also suggested that further research was “needed to clarify the significance of differences between the perceptions of pupils regarding the impact of learning environment characteristics on learning outcomes” (p. 178).

In seeking to contribute to the field of classroom environmental research, Fraser (1982) utilized a previously developed instrument, the Individualized Classroom

Environment Questionnaire (ICEQ), to extend beyond the majority of prior classroom environment studies that had focused “exclusively on student perceptions of actual environment” (p. 512). Fraser sought to extend the research by measuring four variables regarding classroom environment, utilizing the ICEQ to measure student actual, student preferred, teacher actual, and teacher preferred perceptions. As Fraser concluded:

Whereas most prior classroom environment research has restricted its attention to student perceptions of actual environment, this article provides a basis for an extension of this tradition to incorporate also the study of student perceptions of preferred environment, teacher perceptions of actual environment, and teacher perceptions of preferred environment. (p. 517)

Fraser also exposed clear differences between student and teacher perceptions regarding classroom environments.

As Konings, van Zundert, Brand-Gruwel, and van Merriënboer (2007) indicated, “In education it is common practice for educational designers and teachers to create learning environments that are expected to be as beneficial as possible for students, without any interference from their users (i.e. students)” (p. 445). As Konings et al. observed, “the need to pay more attention to students’ perspective on educational design is further strengthened by research showing that striking differences do exist between students’ and teachers’ perceptions” (p. 446). In recognition of “a clear need to invest effort in finding an effective method for reducing these discrepancies” (p. 446), Konings et al. studied the value of participatory design as a means to improve the design of learning environments. Students and teachers were interviewed to explore their opinions regarding the idea of participatory design in developing a learning environment. Konings

et al. concluded that both the background literature and the findings of their study supported the implementation of a participatory design process (p. 461). Konings et al. also suggested that their findings indicated that participatory design could be an effective tool for bridging the existing gap between students and teachers (p. 461).

Shaping 21st-Century Educational Facilities

As Moore and Lackney (1993) indicated, there is an elusive yet very important relationship between architectural design and educational reform. The development and use of new design patterns will come from what Moore and Lackney described as “a collaborative dialogue between researchers and practitioners from both the architectural and educational professions” (pp. 16-17). Moore and Lackney outlined the need for a process view of the implementation as new design patterns emerge. As Moore and Lackney concluded:

The implications of this process view further suggest that new design patterns will emerge from the feedback of students, teachers, and administrators in school facilities as the struggle to implement these and other reform ideas. Including students and teachers in the process of identifying design patterns which work will not only increase their environmental awareness of the possible use and management of classroom space, but may further support the spatial and environmental implications of educational reform ideas at a grassroots level.

(p. 17)

Students should be viewed as an integral team member when considering the design and programming of new educational facilities. To overlook or exclude their voice may create a void in the shaping of 21st-century schools.

In assessing the educational reform literature, Moore and Lackney (1994) concluded:

In many cases, there is no discussion of architecture. And yet, when one reads this literature with an architectural eye, much of it is pregnant with ideas, ways in which the appropriate design in educational facilities can set the stage for more easily, efficiently, and productively achieving the latest educational reform ideas. (p. 36)

Why then the lack of substantive changes in the design of new educational facilities? Moore and Lackney argued that “current educational facility planning models in the architectural and educational literature are at most, partially successful in their aim of guiding educational planners through the facility planning process” (p. 77). Even though special emphasis is given to gaining a student perspective, many planning efforts fall short of this recommendation. Moore and Lackney concluded a more interactive model was needed to allow a wider audience to participate in the planning process in order to lead to more appropriate 21st-century learning environments (p. 85).

The Need for Evaluation of Current Planning and Design Efforts

There have been many studies showing the connection between the condition of school facilities and educational outcomes. Bosch (2003) “proposed that one reason why previous research regarding the effects of the physical school environment on educational outcomes has had little impact on the quality of schools is because there is a lack of knowledge about these relationships” (p. 1). Three primary obstacles to utilization of the findings were identified as: (a) lack of knowledge, (b) unawareness on the part of decision-makers, or (c) decision makers who are familiar with the findings yet choose to

ignore them. Bosch initially conducted a literature analysis to understand the objectives of school facility researchers. Secondly, a concept mapping methodology was utilized to interview educators to develop a “list of measures of student, school, or school district success” (p. 1). Bosch utilized these findings to develop a set of priorities for further research, and pointed to a need for coordinated efforts between researchers and educational decision makers.

In a case study sponsored by the Council of Educational Facility Planners International (CEFPI) intended to evaluate process and outcomes from recently opened high schools, Withycombe (1997) considered the critical research questions that needed to be answered included:

1. What steps were taken to involve district staff members and community representatives in educational-specifications and design-development work?
2. How effective did these steps prove to be?
3. What impact did this involvement appear to have on the emergent and completed high school project? (p. 6)

Although little, if any, questioning within this case study was directed specifically at student involvement, Withycombe observed that at least one of the sites, where “planners designed and activated a broad-based input and shared decision-making process, which engaged many members of the community” (p. 37), found a specific benefit from the involvement of students. As Withycombe concluded, “their suggestions led to the design of significant elements of the commons” (p. 37), and that their “contributions helped ensure that the commons would be an inviting place for students” (p. 37).

As Chen (2002) suggested, “this relationship – between the buildings our students, teachers, and administrators work in, and the quality of the work they do – should be better understood” (p. 2). As Van Note Chism (2002) suggested, “We know too much about how learning occurs to continue to ignore the ways in which learning spaces are planned, constructed, and maintained” (p. 5). The evidence certainly suggests that better school facilities will be the result of: (a) more effective research, and (b) design and educational professionals who are better informed about the variables affecting educational outcomes.

Current Design and Planning Process Should Change

Neutra (1935) concluded, “that school buildings, planned as places to acquire facts through motionless receptivity, defy every effort of administrators and teachers to meet present demands of progressive educational practices” (p. 25). Neutra observed how changes in economic and technological conditions had placed new demands on educators. As a result, Neutra suggested that “the redesigning of the *individual classroom unit* as the basic element of the school plant thus becomes a primary necessity” (p. 25). The suggestion by Neutra to advance designs based on educational reforms, seems to be overlooked by the current facilities that perpetuate industrial model schools. Unless the last 75 years have brought little changes in the area of educational reforms, the planning and programming process should generate new school facility designs.

In 2005, the American Architectural Foundation (AAF) convened the National Summit on School Design. The Summit brought together a variety of educational stakeholders including teachers, administrators, students, and architects to help focus the national discussion regarding school facility design. Among the recommendations that

Summit participants concluded was critical to help shape schools of the future was an emphasis on the proper engagement of the community in the planning process. As AAF (2006) reported:

It is important to allow students to participate in the discussion process as well. The input from these visioning sessions should shape how the facilities are designed... It is evident that widespread efforts to engage citizens, educators, and students are practiced; however participants report that often this activity is viewed as simply a strategy for gaining public support for funding initiatives or as ‘window dressing’ with little influence on the final design or decision making.
(p. 39)

In 2006, the AAF also convened the Design for Learning Forum in an effort to continue the dialogue regarding the future of school design. In outlining the key findings of the forum, Sullivan (2007) concluded that the “design process must include many voices, including students and teachers who will inhabit the space on a daily basis” (p. 7). In evaluating the changes necessary to move school design in the right direction, Sullivan suggested one of the consistent themes that emerged was “the call... to follow the children, to find a way to give voice to the students” (p. 43).

According to Kelly (2009), the current process used to design school facilities is unlikely to result in the changes needed to meet the needs of future learners. “What is currently lacking from the school design process is a way to set aside old assumptions about teaching and learning in order to allow people to develop new visions for the future” (p. 36). As Kelly concluded, we must first ask the right people, including students, and then ask them the right questions (p. 37). Instead of asking questions about

the way things have been in the past, Kelly urged that architects begin the process by asking educators and students what will be (p. 42).

Roberts (2009) suggested, “it is essential to take the purpose of facilities into account when considering their connection to learning outcomes” (p. 369). Is there a better source for understanding learning outcomes than asking the students themselves? To better understand the impact of designing without student participation seems worthy of additional research. As Flutter and Rudduck (2004) concluded, “The transformative potential of pupil participation will be lost if established structures within schools prevent this movement from taking root and flourishing” (p. 139).

As Van Note Chism and Bickford (2002b) suggested, “The need for change in the design of learning spaces demands radical rethinking of many powerful traditional assumptions” (p. 91). To continue along the path of designing facilities without the involvement of users, specifically students, misses the opportunity to create learner-centered facilities. As Van Note Chism and Bickford noted, students “need to be part of a dialogue aimed at gaining understanding and momentum around abandoning the old assumptions that guided decision making them with a new understanding of how learning spaces shape learning” (p. 95). Van Note Chism and Bickford concluded that “it is necessary to acknowledge the importance of learning spaces, revise the ways in which institutions plan for them, and augment the role of faculty and student users in the decision making” (p. 97).

Evidence suggests that the design process must change in order for the facilities to change. In response to the research pointing to student engagement as a critical condition for learning, Li, Locke, Nair, and Bunting (2005) suggested:

An argument can be made that facilities need to be ahead of the educational systems curve.... accelerating a process that may have otherwise taken much longer. School buildings can become real symbols for change, but for that to happen it is necessary to reengineer the process by which they are created. (p. 20)

To continue creating schools following the industrial model's repetition of classrooms along corridors has perhaps far exceeded its purpose. In fact, as Li et al. proposed:

The purpose of the school development process is to shift the focus away from the building and toward the goals of the facility: to support the teaching and learning modalities of the 21st century.... Such purpose built schools will almost never look and feel like their traditional counterparts because they do not begin with the assumption that classrooms and corridors are the basic building blocks for every school. (p. 20)

Li et al. also stated that a successful development process "starts with involving as many stakeholders as possible" (p. 20). Li et al. further suggested that, the purpose of the dialogue between designers and user must focus on the development of "a shared vision for the school – one that will guide every aspect of its development" (p. 21). Students are integral stakeholders in 21st-century learning and should be given a corresponding engagement in the design process.

As Bergsagel, Best, Cushman, McConachie, Sauer, and Stephen (2007) suggested, "Nostalgic gravity – which pulls people back to what they know and have themselves experienced – and insufficient knowledge stifle innovation" (p. 2). As school facilities undergo major remodeling efforts, or perhaps even more critically, are replaced with new facilities, changes in design must be considered. Bergsagel et al. also noted:

As school districts nationwide are projected to spend hundreds of billions of dollars on K-12 construction in the next decade, leaders have an unparalleled opportunity to use the facilities planning process to leverage educational reform. If we are truly committed to success for all learners, we must incorporate well-designed facilities into our reform agenda. (p. 2)

Too many new facilities fail, as Bergsagel et al. concluded, to break from the traditional model of placing identical classrooms along double-loaded corridors, squandering opportunities to provide spaces that support rather than hinder learning environments (p. 2).

According to Nair (2006):

today's educational vision should be vastly different than what we had (mostly) for the past fifty years. By necessity, the places in which children and adults learn in the future should also look very different from the schools that we too often continue to build. (p. 28)

The tendency toward conformity, rather than innovation, seems to force the design process away from the changes needed to better connect facilities to the needs of 21st-century learners. As Nair suggested, due to trappings of past design and programming practices, educators and planners are unfortunately “distracted from asking crucial questions” (p. 28). There is certainly evidence to suggest that all stakeholders, especially students, need to become more engaged in the process.

Lippman (2010) developed a study to explore the role educational specialists had played in shaping educational facilities. The study included a broad sampling of specialists who had been involved in the programming, planning, and design of schools.

Lippman observed stakeholder involvement as one of the key areas of concern among participants (p. 321). Lippman also observed the misfortune that “a participatory process involving stakeholders at the early stages of the project is generally viewed as cumbersome and time-consuming by the client and by many design professionals” (p. 324). For this reason, a participatory process is often bypassed, or given minimal emphasis. As Lippman noted, “the purpose of the participatory process is to identify the differences and similarities among the many stakeholders” (p. 325). Noting the importance of gaining a better understanding of both the similarities and differences among stakeholders, Lippman suggested that “research tools should be developed to guide this process” (p. 325).

Conclusions

As our existing school facilities continue to age, the design of new schools is inevitable. With more than 7.5 billion dollars of new school construction projected to start in 2011 (Abramson, 2011, CR5), the need for improved design and programming efforts is critical. Will we continue to perpetuate the Industrial Age model of classrooms along double-loaded corridors, or is there an opportunity to gain a better understanding of the activity within the classroom to lead us in a different direction? Too much is known about the value of stakeholder involvement to ignore their input, and seek to better understand the perceptions of the educators and students who will occupy these facilities. As Long and Ehrmann (2005) concluded, changes in the classroom will come “From seeing faculty and students as the recipients of new learning spaces designed by specialists, to using their dreams of better teaching and learning to shape pioneering new learning spaces” (Conclusion section, ¶ 1).

In a report written for the Educational Facilities Laboratories (EFL), Gross and Murphy (1969) suggested that “Old walls should not stifle new ideas. Identical boxes must not enforce the same program on all students and teachers: each is a unique individual” (p. 16). Gross and Murphy also observed that when mentioning the word *school*, most people circa 1969 would have envisioned “a rectangular room that encloses a teacher facing approximately 30 pupils” (p. 20). Has much changed over the last 40-plus years? With more than four decades separating their observation, most people are likely to still envision a rectangular room housing a teacher and about 30 students. Even though, within the same span of time, we have seen dramatic changes in educational delivery, our school facilities seem locked in the past. Even though there are some examples of change emerging from the design and programming efforts to shape new school facilities, the vast majority of schools continue to produce buildings that mirror conventional patterns. Gross and Murphy concluded, “Too many of our schools still stand as handicaps to new programs and new thinking in education” (p. 85). If asked to update their report today, it is likely that the EFL would conclude that little has changed. Perhaps Gross and Murphy anticipated the challenges that facility planners and educators would face in acknowledging that “there are more questions than answers in planning schools which will stand into the 21st century as our legacy to education” (p. 85).

In questioning the continuation of Industrial Age high schools, Kelly (2009) offered a good indication that little has changed. Even though “the industrial model fails more than 30% of all students... traditional high schools persist” (p. 90). As Kelly noted:

Despite these terrible and widely acknowledged statistics, the industrial model is, practically speaking, the ‘definition’ of what a high school is, and is used for

almost every type of community. We are still building them. In planning a new high school... the question is rarely about who the kids are that need to be serviced or what they need to succeed. (p. 90)

Instead of seeking student input during the design process of schools, we continue to assume that students will adapt to the facilities we offer them. As Kelly concluded, “They are rarely seen as ‘customers’ to be attracted, served, or pleased” (p. 90). Kelly also suggested, that while there is always risk in trying new ideas, “Surely, continuing to build and operate Industrial Age high schools is far greater risk than seeking new alternatives” (p. 94).

The current literature clearly suggests the need for further research to gain a better understanding of the value of stakeholder input during the design and programming process of school facilities. Frith and Whitehouse (2009) expressed concern “that given pressing and political demands, and the lack of knowledge about school interior design, whether the current rhetoric of transformative design will bring real change” (p. 107).

Change certainly seems unlikely if the process continues to follow the current design and programming practices. As architects and educators learn to work in a more collaborative setting to design new school facilities, a better knowledge of the perceptions of teachers and students seems imperative.

CHAPTER III

METHODOLOGY

Introduction

Even though the annual amount of money spent on school construction has been declining since 2005, data from School Planning and Management's 16th Annual School Construction Report indicated that that our investment in school facilities still totaled \$14.5 billion in 2010 (as cited in Robertson, 2011). As Robertson suggested, "\$14.5 billion is still a significant investment in school infrastructure" (p. 16). The same report also indicated that \$8.7 billion of the 2010 total was spent on new construction, with \$8.1 billion in new construction expected to be completed in 2011, and \$7.4 billion anticipated to begin in 2012. The ongoing investment in new school construction is significant. It seems imperative for educational leaders and facility planners to be sure that the investment we are making in bricks and mortar is on the right path. There is an opportunity, if not a responsibility, to reshape the pattern of 21st-century educational facilities.

The current process for the programming and design of school facilities seems to be trapped in the past. As Guldbaek, Vinkel, and Broens (2011) suggested:

The world has been changing so fast that educational systems have not had time to keep pace. We therefore need to rethink, renew and modernise our schools, as well as develop a new educational experience for children. In order to do this, it is

crucial that we devise a new approach to developing our educational systems.

(p. 1)

While continuing revelations in educational research are pioneering substantive changes in curriculum and instruction, improvements to school facilities seem to lag behind. We have reshaped how and what we want our children to learn. We have even created the measurements to assess their level of achievement. It would seem however, that we have forgotten to reshape our school facilities. As Guldbaek, Vinkel, and Broens concluded, “We simply can’t lead the future by reproducing what we did in the past. We need to move from traditional ways of thinking and dare to try new things” (p. 1).

This study was intended to build on the body of quantitative research linking the impact of school facilities with student achievement (Bishop, 2009; Crook, 2006; Hickman, 2002; Uline & Tschannen-Moran, 2008). Although the focus of this study was not directed toward a further understanding of the impact of facilities on student achievement, the body of research linking facilities to educational outcomes clearly suggests the importance of quality in the physical setting of the learning environment. Many of the researchers who utilized quantitative studies for this purpose have suggested the need for qualitative research to gain further understanding of the perceptions of the participants. Crook indicated that a qualitative analysis of teachers’ perceptions was warranted. Hickman also suggested:

The free responses, gathered as a part of this quantitative survey, indicated that further research utilizing a qualitative approach to assess the relationships that existed with new school buildings might need further exploration. A focus group, individual interviews, or both appear to be another good method of researching

the facility conditions on the relationships between student and staff behavior and attitudes. . . . (p. 131)

The purpose of this study was to understand the perceptions of principals, teachers, and architects regarding the involvement of students in the design and planning process of new school facilities. It was also intended to provide a better understanding of the potential benefits from seeking student involvement during the early stages of the process. Previous research has shown the benefits of asking students to aid in the post-occupancy evaluation process (Lackney, 2001). Rather than waiting until the facility is completed, the evidence also suggests that student participation is equally critical in yielding valuable insight prior to construction, engaging them as co-design participants from the outset of the programming and design process (Grummon, 2009; Newman & Thomas, 2008; Taylor, 2009).

To gain further knowledge of the impact of student involvement, this study explored the following questions:

1. What are the perceptions of educators (teachers), and students in a grade nine through twelve high school setting regarding the physical design characteristics of their learning environment?
2. What perceptions do educators (teachers) in a grade nine through twelve high school setting have regarding the validity of student involvement as a source for input and recommendations regarding the design of new high school facilities?
3. What are the perceptions of high school principals regarding the involvement of students in the design of a new high school facility?

4. What are the perceptions of architects regarding the involvement of various stakeholders, including students, during the design and programming phases of a school facility project?

Research Design

A mixed-methods study was conducted to draw correlations between the quantitative and qualitative findings. As Robson (2002) indicated, multiple methods “can be used in complimentary fashion to enhance interpretability” (p. 371). The intent was to first understand the perceptions of both teachers and students regarding the physical learning environment. Four recently completed high schools were selected to provide a random sample of student and teacher responses. After comparing these perceptions, additional research was also conducted to develop an understanding of the design process utilized for each facility. Voluntary subsets of the teacher sample, as well as the principal from each of the four schools, were utilized as interview participants. The process of triangulation was also utilized, as Gay, et al. (2009) described, “to obtain a more complete picture” of what was being studied (p. 377).

The first component of research utilized the Organisation for Economic Co-operation and Development (OECD) Center for Effective Learning Environments (CELE) student and staff questionnaires. Originally developed for an international pilot study on the Evaluation of Quality in Educational Spaces (EQES), the questionnaires were intended “to collect data from staff and students on subjective aspects related to quality in educational spaces” (CELE-OECD, n.d., p. 6). The EQES questionnaires were utilized in this study, as intended in their original use by CELE, to “better understand how staff and students perceive quality in educational spaces” (p. 6). Permission to use

the questionnaire was obtained from the OECD (Appendix A). They were also intended to obtain quantitative data to help compare the participant perceptions regarding the learning environment. As Gay et al. (2009) indicated, survey research “determines and reports the way things are” (p. 9). The EQES assessment tool was also intended to identify any differences in the perceptions of the two participant groups: teachers, and students. As Robson (2002) noted, “it is possible to go beyond the descriptive to the interpretive, that is, to use the survey to provide explanations of the phenomena studied and the patterns of results obtained” (p. 235). The EQES results were also intended to lend added insight to the qualitative side of this study. The surveys were conducted utilizing a sample of teachers and students from four recently completed new high school facilities located in a Midwestern state.

The second component of research involved interviews among participants from the same four high schools utilized for the initial survey research. Interviews were conducted using a random subset of the teacher participants in order to provide an understanding of their perceptions regarding the validity of student involvement as a source for input and recommendations in the design of new high school facilities. A separate interview was also conducted with the principal of each high school to gain additional insight regarding the programming and design process from their perspective.

In addition, a representative from the architecture firm involved in the design of each facility was interviewed in order to understand the process and procedures utilized to obtain input from stakeholders during the design and programming phase of the project. The interview questions were intended to provide insight regarding the specific site that each architect was responsible for.

The interviews were intended to produce an overall description of the perceptions of the individuals involved in the planning and design process for each site, and “provide a general description of the phenomenon as seen through the eyes of people who have experienced it firsthand” (Leedy & Ormrod, 2005, p. 140). Conducting separate teacher, principal, and architect interviews was also intended to provide a variety of sources for the collection of qualitative data. By utilizing multiple sources, there was also an opportunity to look for triangulation of the data collected regarding the design and planning process (Leedy & Ormrod, p. 136). The primary purpose of the interview portion of the study was to determine (a) if students were given a meaningful voice in the design process of the new school facilities, and (b) if not, was their lack of participation due to a perceived lack of credentials or ability to provide meaningful contributions to the process.

Population

In an effort to provide a representative sample of 21st-century buildings, four recently completed high school facilities were selected from a Midwestern state. Each facility was newly constructed, and completed after the year 2000. To provide a varied, yet representative sample, the characteristics of each facility were also considered during the site selection process.

At the time of the study, the Site 1 high school had an enrollment of 423 students, and was served by 24 teachers. This 151,000 square foot school was constructed to replace an existing high school facility, and was first occupied in the Fall of 2006. The high school serves students in grades nine through twelve.

The Site 1 facility is located within a school district that encompasses several communities as well as pockets of rural areas along the outer-ring of a large metropolitan area. There is only one high school within the district. The facility is located on a campus in a rural area.

At the time of the study, the Site 2 high school had an enrollment of 915 students, and was served by 45 teachers. This 305,000 square foot school was constructed to provide a second high school facility within the school district it serves. Upon completion of the facility, new boundaries were formed within the district to separate the existing high school population between the two high schools. It was first occupied in the Fall of 2007. The high school serves students in grades nine through twelve.

The Site 2 facility is located within a school district that encompasses both suburban and rural areas within a larger metropolitan area. The high school is situated within a suburban land area.

At the time of the study, the Site 3 high school had an enrollment of 810 students, and was served by 38 teachers. This 238,000 square foot school was constructed to replace an existing high school facility, and was first occupied in the Fall of 2010. The high school serves students in grades nine through twelve.

The Site 3 facility serves a school district that encompasses a city of approximately 25,000 people and surrounding rural areas. There is only one high school within the district. The site is located within the city and is situated on a central campus that also includes the district's middle school facility.

At the time of the study, the Site 4 high school had an enrollment of approximately 1,000 students, and was served by 24 teachers. This 92,000 square foot

school was constructed to provide a second high school facility within the school district it serves. The facility was designed to provide additional space due to overcrowding at the district's existing high school facility. Rather than splitting the total high school enrollment of approximately 1,800 students between two buildings, the facility was intended to provide specific curriculum opportunities to the entire student body at the second site. It was first occupied in the Fall of 2003. The high school serves students in grades nine through twelve.

The Site 4 facility serves a school district encompassing a city of approximately 3,800 people that is also surrounded by a township with a total population of approximately 20,000 people. The high school is situated in rural area. It is not located adjacent to the existing high school facility. Students are bussed, or allowed to drive their own vehicles, between the two high schools during the school day to attend classes at both locations if necessary. Some students, based on course selection, attend the Site 4 facility during either the morning or afternoon session. There are approximately 500 students in the facility during each session.

A total of 489 EQES questionnaires were completed by students across all four sites. The breakdown by site was, 87 (21%) out of 423 students at Site 1, 53 (6%) out of 915 students at Site 2, 126 (15%) out of 810 students at Site 3, and 222 (22%) out of approximately 1,000 students who attended Site 4. All grade levels were represented at each site.

In order to obtain the largest possible sample of teachers for completion of the EQES assessment tool, the entire staff at each site was encouraged to complete the teacher survey. The breakdown by site was, 16 (67%) out of 24 teachers at Site 1, 42

(93%) out of 45 teachers at Site 2, 27 (71%) out of 38 teachers at Site 3, and 18 (75%) out of 24 teachers at Site 4. A total of 104 questionnaires were obtained across all four sites.

Teaching staff for the interview phase of the study was a subset of the teachers who completed the EQES questionnaires at each site. Participation in the teaching interview was voluntary. A total of five teachers were interviewed at Site 1, three at Site 2, nine at Site 3, and six at Site 4.

The current principal of each facility was utilized for the principal interview at each site. With the exception of the principal at Site 4, all principals that were interviewed served in the principal role during the design phase of the new facility. The retired principal, who had served in the principal role during the design phase, was also interviewed at Site 4 in a session separate from the current principal's interview. A total of five principals were interviewed.

In addition, a representative from the architecture firm involved in the design of each facility was interviewed. The architect for each site was selected based on their involvement during the design and programming phases of the project. A total of four architects were interviewed in a separate session for each site.

Data Collection

Initial contact for each site was made through the superintendent of the school district. After reviewing the purpose and methodology of the study, each superintendent was asked to provide a permission letter authorizing use of their high school for this study. Each superintendent was also asked to acknowledge (a) their general understanding of the research project, (b) permission to involve the principal, teachers,

and students at their site in the research project on a voluntary basis, and (c) permission for the participants to complete the questionnaires during class time. A sample copy of the permission letter obtained for each site is included in Appendix B.

After receiving permission to proceed, contact was made with the principal at each site. An initial meeting was scheduled with the principal to provide an overview of the study, and establish a site specific schedule for completion of the student questionnaires, teacher questionnaires, teacher interview, and principal interview. Principals served as the main point of contact at each site.

Arrangements were made at each site for the researcher to attend a staff meeting to introduce the purpose and methodology of the study. All teachers were encouraged to participate in the study by completing the Teaching Staff Questionnaire (Appendix C). Prior to completion of the Teaching Staff Questionnaire, each individual was asked to complete an Informed Consent Document (Appendix D). The Informed Consent Document outlined (a) the nature and purpose of the research project, (b) an explanation of the procedures, (c) the possible discomfort and risks associated with their participation in the study, (d) the potential benefits as a result of their participation, (e) the confidentiality and anonymity of their responses, and (f) the opportunity for them to withdraw from the study at any time. After receipt of the Informed Consent Document, the Teaching Staff Questionnaires were distributed to and completed by teachers during the meeting. The questionnaire requested responses regarding various aspects of the places and spaces utilized for teaching, and school spaces in general including (a) teaching spaces, (b) comfort, (c) school appearance, (d) safety and security, and (e) maintenance. Each question utilized a five-point Likert scale allowing for responses

falling between a lower limit of *strongly disagree* and an upper limit of *strongly agree*. Each question also allowed for a response of *not applicable*.

Prior to conclusion of the staff meeting, arrangements were made with individual teachers, on a voluntary basis, to allow the students in their classroom to participate in completion of the student questionnaire. Given the inability on the part of the researcher, or the principal, to require a randomly assigned teacher selection to allow their students to participate, the voluntary basis was considered to be the best method for creating a random sample of student participants. As a variable of control, teachers had no specific involvement in the distribution, introduction, or explanation of the student questionnaire.

Arrangements were made through the principal to have the Request for Parent/Student Permission forms (Appendix E) distributed by participating teachers to students on the day prior to the date scheduled for completion of the Student Questionnaire. The Request for Parent/Student Permission document outlined (a) an explanation of the procedures for the student portion of the study, (b) the confidentiality and anonymity of the student responses, (d) the potential benefits as a result of their participation, and (e) the opportunity for the student to withdraw from the study at any time. Copies of the Student Questionnaires (Appendix F) were distributed by the researcher to students after receipt of the completed permission forms. Students were instructed to respond to the classroom specific portions of the questionnaire based on the classroom they were currently seated in. The questionnaire requested responses regarding various aspects of the individual classroom, and school spaces in general under the categories of (a) accessibility, (b) learning spaces, (c) comfort, (d) school appearance, (e) safety and security, and (f) maintenance. Each question utilized a five-point Likert scale

allowing for responses falling between a lower limit of *strongly disagree* and an upper limit of *strongly agree*. Each question also allowed for a response of *not applicable*. All questionnaires were completed in the classroom during a regularly scheduled class time.

The date for completion of the teaching staff interview was scheduled through the principal on a separate date at each site after the completion of the teacher and student questionnaires. Again, due to the inability on the part of the researcher, or the principal, to require a randomly assigned teacher sample, participation in the interview was based on a voluntary participation basis. As a variable of control, all teachers were given the opportunity to participate in the interviews. The teaching staff interviews were conducted in a group setting at each site. The interviews were conducted utilizing a predefined set of interview questions, and were read by the researcher from the Teaching Staff Interview script (Appendix G). The outline of the teacher interview script included (a) an introduction to the purpose of the interview session and its relationship to the study, (b) questions regarding their involvement in, or familiarity with the design and programming phases of their facility, (c) questions regarding student involvement in the design and programming process, and (d) questions allowing for conclusions or comments regarding the design and programming process. Each interview session was digitally recorded. All participants were informed that if any comments made during the interview were reported in the research findings, that every effort would be made to maintain their anonymity, and that in any subsequent reporting of their comments they would only be referred to as *a teacher* with a reference to the site number they represented.

A final meeting was scheduled to interview the principal at each site. After completion of an Informed Consent Document (Appendix H), each principal interview

was completed on site in a private setting. The Informed Consent Document outlined (a) the nature and purpose of the research project, (b) an explanation of the procedures, (c) the possible discomfort and risks associated with their participation in the study, (d) the potential benefits as a result of their participation, (e) the confidentiality and anonymity of their responses, and (f) the opportunity for them to withdraw from the study at any time. The interviews were conducted utilizing a predefined set of interview questions, and were read by the researcher from the Principal Interview script (Appendix I). The outline of the principal interview script included (a) an introduction to the purpose of the interview session and its relationship to the study, (b) questions regarding their involvement in, or familiarity with the design and programming phases of their facility, (c) questions regarding student involvement in the design and programming process, and (d) questions allowing for conclusions or comments regarding the design and programming process. Each interview was digitally recorded. Principals were informed that if any comments made during the interview were reported in the research findings, that every effort would be made to maintain their anonymity, and that any subsequent reporting of their comments would only be refer to them as *the principal* from the site number they represented.

Architect interviews were scheduled individually and separately with a representative from the architectural firm responsible for the design of each high school. The architects were selected based on their involvement in the design and planning process of the facility. After explanation of the purpose and methodology of the study, each architect was asked to complete an Informed Consent Document (Appendix J). The Informed Consent Document outlined (a) the nature and purpose of the research project,

(b) an explanation of the procedures, (c) the possible discomfort and risks associated with their participation in the study, (d) the potential benefits as a result of their participation, (e) the confidentiality and anonymity of their responses, and (f) the opportunity for them to withdraw from the study at any time. The architects were interviewed in a private setting at a location selected by the participant. The interviews were conducted utilizing a predefined set of interview questions, and were read by the researcher from the Architect Interview script (Appendix K). The outline of the architect interview script included (a) an introduction to the purpose of the interview session and its relationship to the study, (b) questions regarding the involvement of stakeholders during the design and programming phases of their facility, (c) questions regarding student involvement in the design and programming process, and (d) questions allowing for conclusions or comments regarding the design and programming process. The researcher also informed each architect that the interview questions were directed toward the specific site being studied. Each interview was digitally recorded. Each architect was informed that if any comments made during the interview were reported in the research findings, that every effort would be made to maintain their anonymity, and that any subsequent reporting of their comments would only be refer to them as *the architect* from the site number they were responsible for. In addition to the interview script questions, the researcher concluded each interview by asking the architect to summarize their perception of the impact, given as a numerical percentage of the total, that each stakeholder, as individuals or a group, had on the overall design of the facility at their site.

Analytical Methods

To help answer the first question, “What are the perceptions of educators (teachers), and students in a grade nine through twelve high school setting regarding the physical design characteristics of their learning environment?”, an independent-samples *t* test was used to compare the mean scores of the teacher responses on the EQES questionnaire with the corresponding or parallel questions from the students by site. To correct for the inequality of group sizes between the teacher and student samples, the Welch test was used instead of the standard *t* test (Welch, 1947). A Sidak-Bonferroni correction was utilized as the procedure for familywise error control. As Keppel and Wickens (2004) suggested, “It is smaller than the Bonferroni value, so the tests are slightly more powerful, although still conservative” (p. 119). Therefore, only *p*-values less than .003 were considered significant. In order to determine effect size, Cohen’s *d* was also calculated for the items found to be statistically significant.

To help answer the second question, “What perceptions do educators (teachers) in a grade nine through twelve high school setting have regarding the validity of student involvement as a source for input and recommendations regarding the design of new high school facilities?”, qualitative data from the teacher interview sessions were analyzed to determine if any specific themes or general tendencies emerged to indicate a pattern regarding the perception of staff at each site, and in a broader setting across all four sites. As Leedy and Ormrod (2009) suggested, the analysis was intended to determine “a general sense of patterns—a sense of what the data mean” (p. 150).

To help answer the third question, “What are the perceptions of high school principals regarding the involvement of students in the design of a new high school

facility?”, qualitative data from the principal interview sessions were analyzed to determine if any specific themes or general tendencies emerged from the data to suggest a specific pattern regarding the perceptions of the principal at each site. The collective responses of all principals were also analyzed to determine if, in a broader setting across all four sites, a common pattern of perceptions occurred. The focus of the analysis was intended to gain a general understanding of the framework utilized by principals to gain input from stakeholders during the design and planning process.

To help answer the fourth question, “What are the perceptions of architects regarding the involvement of various stakeholders, including students, during the design and programming phases of a school facility project?”, qualitative data from the architect interview sessions were analyzed to determine if any specific themes or general tendencies emerged from the data to suggest a specific pattern regarding the perceptions of the architect for each site. The collective responses of all architects were then analyzed to determine if, in a broader setting among all four sites, a common pattern of perceptions occurred. The focus of the analysis was intended to gain a general understanding of the organizational methods utilized by architects to gain input from stakeholders during the design and planning process.

A composite analysis of the teacher, principal, and architect interview responses was also explored to determine if a pattern emerged regarding the idea of student involvement in the design and planning process across all of the four sites. The purpose of this overall evaluation was to, as Leedy and Ormrod (2005) suggested, determine if a common theme existed “despite the diversity in the individuals” (p. 140). The examination of the composite interview data was also intended to report any practical

implications regarding the design and planning process of future facilities (Leedy & Ormrod).

Limitations

This study was limited to four sites in a specific geographic area, and therefore has limitations. It is difficult to generalize the findings as representative of all new high schools since the data were collected from a fairly small sample of the overall population of high school students and teachers, even among new facilities completed since the year 2000. It may also be too early in this century to predict a pattern of specific change in the design of new high schools. Given the average lifespan of a high school facility may exceed 50 years, the influence of time may provide a greater measure of the impact each facility has on both teachers and students.

Weinstein (1979) suggested that field-based observations often present methodological challenges. As Weinstein concluded, “The inability to assign subjects randomly to conditions, the lack of control over extraneous variables, and the need to conduct measurements unobtrusively are but a few of the constraints” (p. 600). The student and teacher questionnaires for this study were conducted in a post-occupancy setting. The differences in the post-occupancy perceptions of occupants regarding a facility may not accurately indicate or predict their ability to provide differing, meaningful, or valuable input during the programming and design phase of the project.

Because of the limited number of student and teacher responses at each site, it was not possible to examine sub-categories within the sample. For instance, it may have been beneficial to explore differences among students by grade level, or differences among teachers by subject taught or years of experience. The qualitative data obtained

from the principal interviews also came from a very small sample and may not represent the views of the entire population of high school principals who have been involved in the design of all new high school facility completed since the year 2000, or suggest a true pattern of principals who would be given this opportunity in the future.

The qualitative data obtained from the architect interviews was gathered from a very small sample. Even though the architects each had well established credentials in the design of new high schools, and also represented a group of firms with strong K-12 educational portfolios, it would be difficult to conclude that they represent the architectural community as a whole. The school facility expertise, planning methods, and approach to stakeholder involvement among architects could vary greatly across a larger sample, or greater geographic region.

CHAPTER IV

FINDINGS AND CONCLUSIONS

Introduction

Billions of dollars are spent each year on school facility improvements. Even though the annual amount of money spent on school construction has been declining since 2005, the ongoing investment in capital improvements remains a significant one. It seems imperative for educational leaders and facility planners to be sure that the investment we are making in bricks and mortar is on the right path. There is an opportunity, if not a responsibility, to reshape the pattern of 21st-century educational facilities.

As Borden (2004) suggested, “when the design process focuses solely on the input and opinions of adults, it overlooks the perspective of the school’s true clients—its students” (p. 1). If school designers continue working primarily with school administrators and teachers to gain insight regarding school facilities, is there any certainty that they will produce child-centered solutions? Lack of substantive change in the design of school facilities suggests the need for a better understanding of the methodology behind school facility design decisions, and an effort to determine if these decisions truly represent the needs of 21st-century learners. As Borden concluded, “Students use buildings differently than teachers and administrators, and they have good ideas about what works and what doesn’t” (p. 1). As true stakeholders in 21st-century learning, students should be given a role in the design process.

This mixed-methods study was conducted at four recently completed high schools to explore the perceptions of principals, teachers, and architects regarding the involvement of students in the design and planning process of new school facilities. It was also intended to provide a better understanding of the potential benefits from seeking student involvement during the early stages of the process. Having a better understanding of the shared or differing perceptions between educators and students should assist architects and educators as they develop the programming and design of new educational facilities.

To gain further knowledge of the impact of student involvement, this study explored the following questions:

1. What are the perceptions of educators (teachers), and students in a grade nine through twelve high school setting regarding the physical design characteristics of their learning environment?
2. What perceptions do educators (teachers) in a grade nine through twelve high school setting have regarding the validity of student involvement as a source for input and recommendations regarding the design of new high school facilities?
3. What are the perceptions of high school principals regarding the involvement of students in the design of a new high school facility?
4. What are the perceptions of architects regarding the involvement of various stakeholders, including students, during the design and programming phases of a school facility project?

Change has come very slowly for school facility design, and certainly seems unlikely if the process continues to follow the current design and programming practices.

As architects and educators learn to work in a more collaborative setting to design new school facilities, a better knowledge of the perceptions of teachers and students seems imperative. Who better to tell us about the functional aspects, what works or does not work, than students themselves?

Findings

Question 1: Perceptions Regarding the Physical Design Characteristics of Their Learning Environment

The EQES questionnaires were utilized in this study, as intended in their original use by CELE, to “better understand how staff and students perceive quality in educational spaces” (CELE-OECD, n.d., p. 6). The EQES assessment tool was also utilized within this study to identify any differences in the perceptions of the two participant groups: teachers, and students. The surveys were conducted utilizing a sample of teachers and students from four recently completed new high school facilities located in a Midwestern state.

The Teaching Staff Questionnaire requested responses regarding various aspects of the places and spaces utilized for teaching, and school spaces in general including (a) teaching spaces, (b) comfort, (c) school appearance, (d) safety and security, and (e) maintenance. A total of 104 EQES questionnaires were completed by teachers across all four sites. The breakdown by site was, 16 (67%) out of 24 teachers at Site 1, 42 (93%) out of 45 teachers at Site 2, 27 (71%) out of 38 teachers at Site 3, and 16 (75%) out of 24 teachers at Site 4. A total of 104 questionnaires were obtained across all four sites.

The Student Questionnaire requested responses regarding various aspects of the individual classroom, and school spaces in general under the categories of

(a) Accessibility, (b) Learning Spaces, (c) Comfort, (d) School Appearance, (e) Safety and Security, and (f) Maintenance. A total of 489 EQES questionnaires were completed by students across all four sites. The breakdown by site was, 87 (21%) out of 423 students at Site 1, 53 (6%) out of 915 students at Site 2, 126 (15%) out of 810 students at Site 3, and 222 (22%) out of approximately 1,000 students who attended Site 4. A cross section of all grade levels was represented at each site.

The EQES assessment tool included a total of 18 corresponding or parallel questions between the teacher and student questionnaires. These questions allowed for a comparison of the teacher and student perceptions regarding (a) Learning Spaces, (b) Comfort, (c) School Appearance, (d) Safety and Security, and (e) Maintenance. An independent-samples *t* test was used to compare the mean scores of the teacher responses with the student responses at each site. Each comparison was tested at the 95% confidence level. As Leedy and Ormrod (2009) stated, “such an interval is often called a confidence interval because it attaches a certain level of probability to the estimate” (p. 269). As Robson (2002) suggested, “These are the limits within which we can be (probabilistically) sure that the *mean* value of the population from which our sample is drawn lies” (p. 409). By verifying that the confidence interval for each test does not contain zero, there is a higher degree of proof that the results did not just occur by chance. Since a total of 18 tests were conducted simultaneously, a Sidak-Bonferroni correction was utilized as the procedure for familywise error control. Therefore, only *p*-values less than .003 were considered significant.

Robson (2002) cautioned that “statistical significance testing is both deeply entrenched in practice and highly controversial” (p. 401). Robson also suggested, “one

problem is that statistical significance is not related to the size or importance of an effect or relationship, which in many cases what we are really interested in” (p. 401). As Cronk (2008) stated, “While statistical hypothesis testing provides a way to tell the odds that differences are real, effect sizes provide a way to judge the relative importance of those differences” (p. 103). Therefore, where p -values of this study indicated a statistically significant difference between the teacher and student perceptions for a specific question, Cohen’s d was also calculated to gauge the practical significance of the observed differences. The Cohen’s d calculator (Becker, 2000) was utilized for these calculations. Cohen (as cited in Robson, 2002) “provides guidelines suggesting that a value of 0.2 is small; 0.5 is medium; and 0.8 is large” (p. 437).

Site 1

An independent-samples t test was calculated comparing the mean score of the teachers and students for the 18 corresponding or parallel questions. No significant differences were found within any category of questions for this site. As indicated in Table 1 through 10, the mean of the teachers was not significantly different from students for any of the questions at Site 1. Although some tests, specifically within the categories of Comfort, Safety and Security, and Maintenance, did reveal a p -value less than .05, and also provided favorable result in regard to the 95% confidence interval, they were not considered significant for the purposes of this study due to the Sidak-Bonferroni correction for familywise error control. Therefore, the findings at Site 1 did not support the idea that the perceptions of students regarding the physical design characteristics of their learning environment differed significantly from the teachers.

Table 1

Site 1 - Group Statistics on Questions Regarding Learning Spaces

| Question | Group | <i>n</i> | <i>M</i> | <i>SD</i> |
|---|---------|----------|----------|-----------|
| There is plenty of space at my desk | Student | 87 | 4.13 | .873 |
| | Teacher | 16 | 4.06 | 1.289 |
| Comparison of T1.2C and S2.1B - there is plenty of space to move around in CR | Student | 87 | 3.71 | 1.077 |
| | Teacher | 16 | 3.06 | 1.482 |
| Comparison of T1.2A and S2.1B - the spaces are large enough to accommodate students | Student | 87 | 3.71 | 1.077 |
| | Teacher | 16 | 4.06 | 1.289 |
| I have access to functioning computers with Internet | Student | 85 | 3.21 | 1.390 |
| | Teacher | 15 | 2.67 | 1.345 |

Note. CR = classroom.

Table 2

Site 1 – Test Results for Comparison of Student and Teacher Responses on Questions Regarding Learning Spaces

| Question | <i>t</i> | <i>df</i> | Sig. (2-tailed) | Zero in C. Int'l? | Cohen's <i>d</i> |
|---|----------|-----------|-----------------|-------------------|------------------|
| There is plenty of space at my desk | .190 | 17.62 | .851 | Y | - |
| Comparison of T1.2C and S2.1B - there is plenty of space to move around in CR | 1.675 | 18.03 | .111 | Y | - |
| Comparison of T1.2A and S2.1B - the spaces are large enough | -1.022 | 19.04 | .320 | Y | - |
| I have access to functioning computers with Internet | 1.440 | 19.65 | .166 | Y | - |

Note. CR = classroom.

Table 3

Site 1 - Group Statistics on Questions Regarding Comfort

| Question | Group | <i>n</i> | <i>M</i> | <i>SD</i> |
|--|---------|----------|----------|-----------|
| CR has good air circulation | Student | 87 | 3.69 | 1.103 |
| | Teacher | 16 | 3.81 | 1.167 |
| Temperature in CR is comfortable in Winter | Student | 87 | 2.89 | 1.324 |
| | Teacher | 14 | 3.21 | 1.369 |
| Temperature in CR is comfortable in Summer | Student | 84 | 3.26 | 1.142 |
| | Teacher | 14 | 3.57 | .938 |
| Not too much noise coming from outside CR | Student | 87 | 3.72 | 1.117 |
| | Teacher | 16 | 2.94 | 1.389 |
| My CR has good lighting | Student | 87 | 4.57 | .709 |
| | Teacher | 16 | 4.50 | .966 |

Note. CR = classroom.

Table 4

Site 1 – Test Results for Comparison of Student and Teacher Responses on Questions Regarding Comfort

| Question | <i>t</i> | <i>df</i> | Sig. (2-tailed) | Zero in C. Int'l? | Cohen's <i>d</i> |
|--|----------|-----------|-----------------|-------------------|------------------|
| CR has good air circulation | -.390 | 20.24 | .701 | Y | - |
| Temperature in CR is comfortable in Winter | -.839 | 17.15 | .413 | Y | - |
| Temperature in CR is comfortable in Summer | -1.106 | 20.03 | .282 | Y | - |
| Not too much noise coming from outside CR | 2.142 | 18.74 | .046 | N | - |
| My CR has good lighting | .295 | 18.09 | .771 | Y | - |

Note. CR = classroom.

Table 5

Site 1 - Group Statistics on Questions Regarding School Appearance

| Question | Group | <i>n</i> | <i>M</i> | <i>SD</i> |
|---|---------|----------|----------|-----------|
| The outside of the building is welcoming and attractive | Student | 87 | 4.22 | .895 |
| | Teacher | 16 | 4.63 | .806 |
| The inside of the building is welcoming and attractive | Student | 87 | 4.22 | .895 |
| | Teacher | 16 | 4.50 | .894 |

Table 6

Site 1 – Test Results for Comparison of Student and Teacher Responses on Questions Regarding School Appearance

| Question | <i>t</i> | <i>df</i> | Sig. (2-tailed) | Zero in C. Int'l? | Cohen's <i>d</i> |
|---|----------|-----------|-----------------|-------------------|------------------|
| The outside of the building is welcoming and attractive | -1.822 | 22.37 | .082 | Y | - |
| The inside of the building is welcoming and attractive | -1.157 | 20.91 | .260 | Y | - |

Table 7

Site 1 - Group Statistics on Questions Regarding Safety and Security

| Question | Group | <i>n</i> | <i>M</i> | <i>SD</i> |
|-----------------------------------|---------|----------|----------|-----------|
| I feel safe in school | Student | 87 | 4.14 | .979 |
| | Teacher | 16 | 4.50 | .516 |
| I feel safe in the school grounds | Student | 87 | 4.11 | 1.005 |
| | Teacher | 16 | 4.50 | .516 |

Table 8

Site 1 – Test Results for Comparison of Student and Teacher Responses on Questions Regarding Safety and Security

| Question | <i>t</i> | <i>df</i> | Sig. (2-tailed) | Zero in C. Int'l? | Cohen's <i>d</i> |
|-----------------------------------|----------|-----------|-----------------|-------------------|------------------|
| I feel safe in school | -2.177 | 38.43 | .036 | N | - |
| I feel safe in the school grounds | -2.290 | 39.80 | .027 | N | - |

Table 9

Site 1 - Group Statistics on Questions Regarding Maintenance

| Question | Group | <i>n</i> | <i>M</i> | <i>SD</i> |
|--|---------|----------|----------|-----------|
| CR's are clean | Student | 87 | 4.18 | .785 |
| | Teacher | 16 | 3.88 | 1.258 |
| The school building and grounds are generally clean | Student | 87 | 4.15 | .785 |
| | Teacher | 16 | 4.13 | .957 |
| CR's are in good physical condition | Student | 87 | 4.53 | .679 |
| | Teacher | 16 | 4.38 | 1.025 |
| The school buildings and grounds are well maintained | Student | 87 | 4.45 | .759 |
| | Teacher | 16 | 4.50 | .894 |
| The toilet spaces are clean and functional | Student | 85 | 3.84 | 1.153 |
| | Teacher | 16 | 4.56 | 1.031 |

Note. CR = classroom.

Table 10

Site 1 – Comparison of Student and Teacher Responses on Questions Regarding Maintenance

| Question | <i>t</i> | <i>df</i> | Sig. (2-tailed) | Zero in C. Int'l? | Cohen's <i>d</i> |
|--|----------|-----------|-----------------|-------------------|------------------|
| CR's are clean | .949 | 17.21 | .356 | Y | - |
| The school building and grounds are generally clean | .096 | 18.89 | .924 | Y | - |
| CR's are in good physical condition | .577 | 17.50 | .571 | Y | - |
| The school buildings and grounds are well maintained | -.217 | 19.18 | .830 | Y | - |
| The toilet spaces are clean and functional | -2.539 | 22.68 | .018 | N | - |

Note. CR = classroom.

Site 2

An independent-samples *t* test was calculated comparing the mean score of the teachers and students regarding perceptions about the physical design characteristics of the learning environment at Site 2. As indicated in Table 11 and 12, within the category of questions pertaining to Learning Spaces, significant differences were found between the means of the students and teachers ($t(70.13) = 4.151, p = .000$) regarding their perceptions about the amount of space to move around within the classroom. The mean of the students ($M = 4.09, SD = 0.986$) was significantly higher than the mean of the teachers ($M = 2.95, SD = 1.359$). The results of the Cohen's *d* calculation indicated a large ($d = 0.96$) effect size. Significant differences were also found between the means of the students and teachers ($t(78.68) = 3.312, p = .001$) regarding their perceptions about

whether the spaces are large enough to accommodate the number of students. The mean of the students ($M = 4.09$, $SD = 0.986$) was significantly higher than the mean of the teachers ($M = 3.33$, $SD = 1.203$). The results of the Cohen's d calculation indicated a large ($d = 0.96$) effect size. The findings at Site 2 indicated that the perception of students about their ability to move around the classroom, and work each other within the physical space of the room was different than the perception of the teachers. This seems to suggest that teachers may carry a greater concern for, or place a higher importance on, the amount of space needed to move around within the classroom than the students do.

Table 11

Site 2 - Group Statistics on Questions Regarding Learning Spaces

| Question | Group | n | M | SD |
|---|---------|-----|------|-------|
| There is plenty of space at my desk | Student | 53 | 3.96 | 1.160 |
| | Teacher | 41 | 4.37 | .915 |
| Comparison of T1.2C and S2.1B - there is plenty of space to move around in CR | Student | 53 | 4.09 | .986 |
| | Teacher | 41 | 2.95 | 1.359 |
| Comparison of T1.2A and S2.1B - the spaces are large enough to accommodate students | Student | 53 | 4.09 | .986 |
| | Teacher | 42 | 3.33 | 1.203 |
| I have access to functioning computers with Internet | Student | 50 | 3.44 | 1.296 |
| | Teacher | 39 | 3.51 | 1.233 |

Note. CR = classroom.

Table 12

Site 2 – Test Results for Comparison of Student and Teacher Responses on Questions Regarding Learning Spaces

| Question | <i>t</i> | <i>df</i> | Sig. (2-tailed) | Zero in C. Int'l? | Cohen's <i>d</i> |
|---|----------|-----------|-----------------|-------------------|------------------|
| There is plenty of space at my desk | -1.886 | 91.95 | .062 | Y | - |
| Comparison of T1.2C and S2.1B - there is plenty of space to move around in CR | 4.151 | 70.13 | .000 | N | .96 |
| Comparison of T1.2A and S2.1B - the spaces are large enough | 3.312 | 78.68 | .001 | N | .96 |
| I have access to functioning computers with Internet | -.270 | 83.59 | .788 | Y | - |

Note. CR = classroom.

No significant differences were found within the category of questions regarding Comfort at this site. As indicated in Table 13 and 14, the mean of the teachers was not significantly different from students for any questions in this category at Site 2.

Table 13

Site 2 - Group Statistics on Questions Regarding Comfort

| Question | Group | <i>n</i> | <i>M</i> | <i>SD</i> |
|--|---------|----------|----------|-----------|
| CR has good air circulation | Student | 53 | 3.66 | 1.091 |
| | Teacher | 42 | 3.48 | 1.215 |
| Temperature in CR is comfortable in Winter | Student | 53 | 3.30 | 1.137 |
| | Teacher | 38 | 3.53 | .979 |
| Temperature in CR is comfortable in Summer | Student | 49 | 3.33 | 1.068 |
| | Teacher | 42 | 3.43 | 1.172 |
| Not too much noise coming from outside CR | Student | 53 | 3.26 | 1.303 |
| | Teacher | 41 | 3.51 | 1.003 |
| My CR has good lighting | Student | 53 | 4.25 | 1.142 |
| | Teacher | 41 | 4.29 | .929 |

Note. CR = classroom.

Table 14

Site 2 – Test Results for Comparison of Student and Teacher Responses on Questions Regarding Comfort

| Question | <i>t</i> | <i>df</i> | Sig. (2-tailed) | Zero in 95% C. Int'l? | Cohen's <i>d</i> |
|--|----------|-----------|-----------------|-----------------------|------------------|
| CR has good air circulation | .768 | 83.33 | .445 | Y | - |
| Temperature in CR is comfortable in Winter | -1.008 | 85.95 | .316 | Y | - |
| Temperature in CR is comfortable in Summer | -.431 | 83.87 | .667 | Y | - |
| Not too much noise coming from outside CR | -1.043 | 92.00 | .300 | Y | - |
| My CR has good lighting | -.222 | 91.75 | .825 | Y | - |

Note. CR = classroom.

As indicated in Table 15 and 16, within the category of questions pertaining to School Appearance, significant differences were found between the means of the students and teachers ($t(81.46) = -3.689, p = .000$) regarding their perceptions about whether the inside of their building was welcoming and attractive. The mean of the students ($M = 3.98, SD = 1.047$) was significantly lower than the mean of the teachers ($M = 4.60, SD = 0.544$). The results of the Cohen's *d* calculation indicated a medium ($d = -0.743$) effect size. The findings at Site 2 indicated that the perception of students about the inside appearance of the building was different than the perception of the teachers. This seems to suggest that the perceptions of teachers as to what makes a building welcoming and attractive may differ from students.

Table 15

Site 2 - Group Statistics on Questions Regarding School Appearance

| Question | Group | <i>n</i> | <i>M</i> | <i>SD</i> |
|---|---------|----------|----------|-----------|
| The outside of the building is welcoming and attractive | Student | 53 | 3.68 | 1.237 |
| | Teacher | 42 | 4.19 | .833 |
| The inside of the building is welcoming and attractive | Student | 53 | 3.98 | 1.047 |
| | Teacher | 42 | 4.60 | .544 |

Table 16

Site 2 – Test Results for Comparison of Student and Teacher Responses on Questions Regarding School Appearance

| Question | <i>t</i> | <i>df</i> | Sig. (2-tailed) | Zero in 95% C. Int'l? | Cohen's <i>d</i> |
|---|----------|-----------|-----------------|-----------------------|------------------|
| The outside of the building is welcoming and attractive | -2.399 | 90.84 | .018 | N | - |
| The inside of the building is welcoming and attractive | -3.689 | 81.46 | .000 | N | -.743 |

As indicated in Table 17 and 18, within the category of questions regarding Safety and Security, significant differences were found between the means of the students and teachers ($t(85.8) = -3.154, p = .002$) regarding their perceptions about how safe they feel within the school building. The mean of the students ($M = 3.94, SD = 1.216$) was significantly lower than the mean of the teachers ($M = 4.57, SD = 0.703$). The results of the Cohen's *d* calculation indicated a medium ($d = -0.634$) effect size. Significant

differences were also found between the means of the students and teachers ($t(83.75) = -3.201, p = .002$) regarding their perceptions about how safe they feel when they are on school grounds. The mean of the students ($M = 3.94, SD = 1.216$) was significantly lower than the mean of the teachers ($M = 4.57, SD = 0.668$). The results of the Cohen's d calculation indicated a medium ($d = -0.642$) effect size. The findings at Site 2 indicated that the perceptions of students regarding safety and security at their facility differed from the perceptions of teachers in this category.

Table 17

Site 2 - Group Statistics on Questions Regarding Safety and Security

| Question | Group | <i>n</i> | <i>M</i> | <i>SD</i> |
|-----------------------------------|---------|----------|----------|-----------|
| I feel safe in school | Student | 53 | 3.94 | 1.216 |
| | Teacher | 42 | 4.57 | .703 |
| I feel safe in the school grounds | Student | 53 | 3.94 | 1.216 |
| | Teacher | 42 | 4.57 | .668 |

Table 18

Site 2 – Test Results for Comparison of Student and Teacher Responses on Questions Regarding Safety and Security

| Question | <i>t</i> | <i>df</i> | Sig. (2-tailed) | Zero in 95% C. Int'l? | Cohen's <i>d</i> |
|-----------------------------------|----------|-----------|-----------------|-----------------------|------------------|
| I feel safe in school | -3.154 | 85.80 | .002 | N | -.634 |
| I feel safe in the school grounds | -3.201 | 83.75 | .002 | N | -.642 |

As indicated in Table 19 and 20, within the category of questions pertaining to Maintenance, significant differences were found between the means of the students and teachers ($t(84.45) = -5.394, p = .000$) regarding their perceptions about the cleanliness and functional aspects of the toilet spaces. The mean of the students ($M = 3.37, SD = 1.264$) was significantly lower than the mean of the teachers ($M = 4.52, SD = 0.773$). The results of the Cohen's d calculation indicated a large ($d = -1.098$) effect size. The findings at Site 2 indicated that the perception of students regarding some aspects of the maintenance of their facility was different than the perception of the teachers within this category.

Table 19

Site 2 - Group Statistics on Questions Regarding Maintenance

| Question | Group | <i>n</i> | <i>M</i> | <i>SD</i> |
|--|---------|----------|----------|-----------|
| CR's are clean | Student | 53 | 3.53 | 1.012 |
| | Teacher | 42 | 3.55 | 1.041 |
| The school building and grounds are generally clean | Student | 52 | 3.83 | 1.098 |
| | Teacher | 42 | 4.05 | .825 |
| CR's are in good physical condition | Student | 53 | 4.47 | .890 |
| | Teacher | 42 | 4.76 | .431 |
| The school buildings and grounds are well maintained | Student | 53 | 4.38 | .925 |
| | Teacher | 42 | 4.57 | .547 |
| The toilet spaces are clean and functional | Student | 51 | 3.37 | 1.264 |
| | Teacher | 42 | 4.52 | .773 |

Note. CR = classroom.

Table 20

Site 2 – Comparison of Student and Teacher Responses on Questions Regarding Maintenance

| Question | <i>t</i> | <i>df</i> | Sig. (2-tailed) | Zero in 95% C. Int'l? | Cohen's <i>d</i> |
|--|----------|-----------|-----------------|-----------------------|------------------|
| CR's are clean | -.091 | 86.95 | .928 | Y | - |
| The school building and grounds are generally clean | -1.112 | 91.57 | .269 | Y | - |
| CR's are in good physical condition | -2.085 | 78.60 | .040 | N | - |
| The school buildings and grounds are well maintained | -1.272 | 86.67 | .207 | Y | - |
| The toilet spaces are clean and functional | -5.394 | 84.45 | .000 | N | -1.098 |

Note. CR = classroom.

Site 3

An independent-samples *t* test was calculated comparing the mean score of the teachers and students regarding perceptions about the physical design characteristics of the learning environment at Site 3. As indicated in Table 21 and 22, within the category of questions pertaining to Learning Spaces, significant differences were found between the means of the students and teachers ($t(28.06) = 3.493, p = .002$) regarding their perceptions about the amount of space to move around within the classroom. The mean of the students was significantly higher ($M = 3.94, SD = 0.926$) than the mean of the teachers ($M = 2.88, SD = 1.453$). The results of the Cohen's *d* calculation indicated a large ($d = 0.870$) effect size. The findings at Site 3 indicated that the perception of students about their ability to move around within the classroom was different than the

perception of the teachers. Data from this site also seemed to indicate that teachers may carry a greater concern for, or place a higher importance on, the amount of space needed to move around within the classroom than the students do.

Differences were also found within the category of questions pertaining to Learning Spaces between the means of the students and teachers ($t(35.05) = -7.156, p = .000$) regarding their perceptions about the access to functioning computers with Internet. The mean of the students was significantly lower ($M = 2.55, SD = 1.343$) than the mean of the teachers ($M = 4.43, SD = 1.121$). The results of the Cohen's d calculation indicated a large ($d = -1.520$) effect size. The findings at Site 3 indicated that the perception of students about access to functioning computers, and Internet access was different than the perception of the teachers. This seems to suggest that teachers may carry a lesser concern for, or place a lower importance on computer access, and Internet capabilities than students do.

Table 21

Site 3 - Group Statistics on Questions Regarding Learning Spaces

| Question | Group | <i>n</i> | <i>M</i> | <i>SD</i> |
|---|---------|----------|----------|-----------|
| There is plenty of space at my desk | Student | 123 | 4.12 | .774 |
| | Teacher | 26 | 3.46 | 1.421 |
| Comparison of T1.2C and S2.1B - there is plenty of space to move around in CR | Student | 124 | 3.94 | .926 |
| | Teacher | 25 | 2.88 | 1.453 |
| Comparison of T1.2A and S2.1B - the spaces are large enough to accommodate students | Student | 124 | 3.94 | .926 |
| | Teacher | 27 | 3.22 | 1.311 |
| I have access to functioning computers with Internet | Student | 122 | 2.55 | 1.343 |
| | Teacher | 23 | 4.43 | 1.121 |

Note. CR = classroom.

Table 22

Site 3 – Test Results for Comparison of Student and Teacher Responses on Questions Regarding Learning Spaces

| Question | <i>t</i> | <i>df</i> | Sig. (2-tailed) | Zero in C. Int'l? | Cohen's <i>d</i> |
|---|----------|-----------|-----------------|-------------------|------------------|
| There is plenty of space at my desk | 2.299 | 28.22 | .029 | N | - |
| Comparison of T1.2C and S2.1B - there is plenty of space to move around in CR | 3.493 | 28.06 | .002 | N | .870 |
| Comparison of T1.2A and S2.1B - the spaces are large enough | 2.685 | 31.88 | .011 | N | - |
| I have access to functioning computers with Internet | -7.156 | 35.05 | .000 | N | -1.520 |

Note. CR = classroom.

No significant differences were found within the category of questions regarding Comfort at this site. As indicated in Table 23 and 24, the mean of the teachers was not significantly different from students for any questions in this category at Site 3.

Table 23

Site 3 - Group Statistics on Questions Regarding Comfort

| Question | Group | <i>n</i> | <i>M</i> | <i>SD</i> |
|--|---------|----------|----------|-----------|
| CR has good air circulation | Student | 126 | 3.83 | .989 |
| | Teacher | 26 | 3.31 | 1.408 |
| Temperature in CR is comfortable in Winter | Student | 126 | 2.97 | 1.073 |
| | Teacher | 27 | 3.07 | 1.238 |
| Temperature in CR is comfortable in Summer | Student | 106 | 3.41 | .934 |
| | Teacher | 20 | 3.45 | .945 |
| Not too much noise coming from outside CR | Student | 126 | 3.87 | 1.068 |
| | Teacher | 25 | 3.40 | 1.225 |
| My CR has good lighting | Student | 126 | 4.30 | .762 |
| | Teacher | 27 | 4.11 | 1.155 |

Note. CR = classroom.

Table 24

Site 3 – Test Results for Comparison of Student and Teacher Responses on Questions Regarding Comfort

| Question | <i>t</i> | <i>df</i> | Sig. (2-tailed) | Zero in C. Int'l? | Cohen's <i>d</i> |
|--|----------|-----------|-----------------|-------------------|------------------|
| CR has good air circulation | 1.787 | 30.29 | .084 | Y | - |
| Temperature in CR is comfortable in Winter | -.412 | 34.85 | .683 | Y | - |
| Temperature in CR is comfortable in Summer | -.193 | 26.49 | .849 | Y | - |
| Not too much noise coming from outside CR | 1.770 | 31.66 | .086 | Y | - |
| My CR has good lighting | .820 | 31.02 | .419 | Y | - |

Note. CR = classroom.

As indicated in Table 25 and 26, within the category of questions pertaining to School Appearance, significant differences were found between the means of the students and teachers ($t(43.22) = -4.615, p = .000$) regarding their perceptions about whether the inside of their building was welcoming and attractive. The mean of the students ($M = 2.86, SD = 1.294$) was significantly lower than the mean of the teachers ($M = 3.96, SD = 1.091$). The results of the Cohen's *d* calculation indicated a large ($d = -0.919$) effect size. The findings at Site 3 indicated that the perception of students about the inside appearance of the building was different than the perception of the teachers. The data from Site 3 also seemed to suggest that the perceptions of teachers as to what makes a building welcoming and attractive may differ from students.

Table 25

Site 3 - Group Statistics on Questions Regarding School Appearance

| Question | Group | <i>n</i> | <i>M</i> | <i>SD</i> |
|---|---------|----------|----------|-----------|
| The outside of the building is welcoming and attractive | Student | 126 | 3.75 | 1.178 |
| | Teacher | 27 | 4.15 | .989 |
| The inside of the building is welcoming and attractive | Student | 126 | 2.86 | 1.294 |
| | Teacher | 27 | 3.96 | 1.091 |

Table 26

Site 3 – Test Results for Comparison of Student and Teacher Responses on Questions Regarding School Appearance

| Question | <i>t</i> | <i>df</i> | Sig. (2-tailed) | Zero in 95% C. Int'l? | Cohen's <i>d</i> |
|---|----------|-----------|-----------------|-----------------------|------------------|
| The outside of the building is welcoming and attractive | -1.814 | 43.39 | .077 | Y | - |
| The inside of the building is welcoming and attractive | -4.615 | 43.22 | .000 | N | -.919 |

No significant differences were found within the category of questions regarding Safety and Security at this site. As indicated in Table 27 and 28, the mean of the teachers was not significantly different from students for any questions in this category at Site 3. Although one of the tests within the category of Safety and Security did reveal a *p*-value less than .05, and also provided favorable result in regard to the 95% confidence interval,

it was not considered significant for the purposes of this study due to the Sidak-Bonferroni correction for familywise error control.

Table 27

Site 3 - Group Statistics on Questions Regarding Safety and Security

| Question | Group | <i>n</i> | <i>M</i> | <i>SD</i> |
|-----------------------------------|---------|----------|----------|-----------|
| I feel safe in school | Student | 126 | 4.21 | .879 |
| | Teacher | 27 | 4.44 | .698 |
| I feel safe in the school grounds | Student | 126 | 4.16 | .833 |
| | Teacher | 27 | 4.48 | .643 |

Table 28

Site 3 – Test Results for Comparison of Student and Teacher Responses on Questions Regarding Safety and Security

| Question | <i>t</i> | <i>df</i> | Sig. (2-tailed) | Zero in 95% C. Int'l? | Cohen's <i>d</i> |
|-----------------------------------|----------|-----------|-----------------|-----------------------|------------------|
| I feel safe in school | -1.531 | 45.59 | .133 | Y | - |
| I feel safe in the school grounds | -2.237 | 46.85 | .030 | N | - |

No significant differences were found within the category of questions regarding Maintenance at this site. As indicated in Table 29 and 30, the mean of the teachers was not significantly different from students for any questions in this category at Site 3. Although one of the tests within the category of Maintenance did reveal a *p*-value less than .05, and also provided favorable result in regard to the 95% confidence interval, it

was not considered significant for the purposes of this study due to the Sidak-Bonferroni correction for familywise error control.

Table 29

Site 3 - Group Statistics on Questions Regarding Maintenance

| Question | Group | <i>n</i> | <i>M</i> | <i>SD</i> |
|--|---------|----------|----------|-----------|
| CR's are clean | Student | 126 | 4.41 | .648 |
| | Teacher | 27 | 4.26 | .903 |
| The school building and grounds are generally clean | Student | 125 | 4.29 | .693 |
| | Teacher | 27 | 4.22 | .847 |
| CR's are in good physical condition | Student | 126 | 4.68 | .602 |
| | Teacher | 27 | 4.30 | .993 |
| The school buildings and grounds are well maintained | Student | 126 | 4.35 | .870 |
| | Teacher | 26 | 4.12 | 1.033 |
| The toilet spaces are clean and functional | Student | 126 | 4.13 | .996 |
| | Teacher | 27 | 4.56 | .577 |

Note. CR = classroom.

Table 30

Site 3 – Comparison of Student and Teacher Responses on Questions Regarding Maintenance

| Question | <i>t</i> | <i>df</i> | Sig. (2-tailed) | Zero in 95% C. Int'l? | Cohen's <i>d</i> |
|--|----------|-----------|-----------------|-----------------------|------------------|
| CR's are clean | .838 | 31.98 | .408 | Y | - |
| The school building and grounds are generally clean | .377 | 33.92 | .709 | Y | - |
| CR's are in good physical condition | 1.946 | 30.22 | .061 | Y | - |
| The school buildings and grounds are well maintained | 1.078 | 32.72 | .289 | Y | - |
| The toilet spaces are clean and functional | -3.014 | 64.29 | .004 | N | - |

Note. CR = classroom.

Site 4

An independent-samples *t* test was calculated comparing the mean score of the teachers and students regarding perceptions about the physical design characteristics of the learning environment at Site 4. As indicated in Table 31 and 32, within the category of questions pertaining to Learning Spaces, significant differences were found between the means of the students and teachers ($t(19.23) = 4.332, p = .000$) regarding their perceptions about the amount of space to move around within the classroom. The mean of the students ($M = 3.87, SD = 1.102$) was significantly higher than the mean of the teachers ($M = 2.56, SD = 1.247$). The results of the Cohen's *d* calculation indicated a large ($d = 1.113$) effect size. The findings at Site 4 also indicated that the perception of students about their ability to move around within the classroom was different than the

perception of the teachers. Data from this site seemed to indicate that teachers may carry a greater concern for, or place a higher importance on, the amount of space needed to move around within the classroom than the students do.

Table 31

Site 4 - Group Statistics on Questions Regarding Learning Spaces

| Question | Group | <i>n</i> | <i>M</i> | <i>SD</i> |
|---|---------|----------|----------|-----------|
| There is plenty of space at my desk | Student | 221 | 3.89 | 1.141 |
| | Teacher | 19 | 4.16 | 1.068 |
| Comparison of T1.2C and S2.1B - there is plenty of space to move around in CR | Student | 221 | 3.87 | 1.102 |
| | Teacher | 18 | 2.56 | 1.247 |
| Comparison of T1.2A and S2.1B - the spaces are large enough to accommodate students | Student | 221 | 3.87 | 1.102 |
| | Teacher | 19 | 3.74 | .991 |
| I have access to functioning computers with Internet | Student | 220 | 3.88 | 1.245 |
| | Teacher | 18 | 4.44 | .856 |

Note. CR = classroom.

Table 32

Site 4 – Test Results for Comparison of Student and Teacher Responses on Questions Regarding Learning Spaces

| Question | <i>t</i> | <i>df</i> | Sig. (2-tailed) | Zero in C. Int'l? | Cohen's <i>d</i> |
|---|----------|-----------|-----------------|-------------------|------------------|
| There is plenty of space at my desk | -1.056 | 21.69 | .303 | Y | - |
| Comparison of T1.2C and S2.1B - there is plenty of space to move around in CR | 4.332 | 19.23 | .000 | N | 1.113 |
| Comparison of T1.2A and S2.1B - the spaces are large enough | .552 | 22.01 | .587 | Y | - |
| I have access to functioning computers with Internet | -2.596 | 23.35 | .016 | N | - |

Note. CR = classroom.

No significant differences were found within the category of questions regarding Comfort at this site. As indicated in Table 33 and 34, the mean of the teachers was not significantly different from students for any questions in this category at Site 4.

Table 33

Site 4 - Group Statistics on Questions Regarding Comfort

| Question | Group | <i>n</i> | <i>M</i> | <i>SD</i> |
|--|---------|----------|----------|-----------|
| CR has good air circulation | Student | 222 | 3.87 | 1.136 |
| | Teacher | 19 | 3.84 | 1.119 |
| Temperature in CR is comfortable in Winter | Student | 222 | 3.43 | 1.319 |
| | Teacher | 19 | 3.53 | 1.124 |
| Temperature in CR is comfortable in Summer | Student | 216 | 3.56 | 1.260 |
| | Teacher | 19 | 3.79 | .976 |
| Not too much noise coming from outside CR | Student | 222 | 3.64 | 1.299 |
| | Teacher | 19 | 3.68 | 1.293 |
| My CR has good lighting | Student | 222 | 4.31 | .843 |
| | Teacher | 19 | 4.42 | .769 |

Note. CR = classroom.

Table 34

Site 4 – Test Results for Comparison of Student and Teacher Responses on Questions Regarding Comfort

| Question | <i>t</i> | <i>df</i> | Sig. (2-tailed) | Zero in C. Int'l? | Cohen's <i>d</i> |
|--|----------|-----------|-----------------|-------------------|------------------|
| CR has good air circulation | .102 | 21.30 | .920 | Y | - |
| Temperature in CR is comfortable in Winter | -.344 | 22.47 | .734 | Y | - |
| Temperature in CR is comfortable in Summer | -.956 | 23.62 | .349 | Y | - |
| Not too much noise coming from outside CR | -.130 | 21.23 | .898 | Y | - |
| My CR has good lighting | -.620 | 21.88 | .542 | Y | - |

Note. CR = classroom.

As indicated in Table 35 and 36, within the category of questions pertaining to School Appearance, significant differences were found between the means of the students and teachers ($t(32.12) = -4.829, p = .000$) regarding their perceptions about whether the inside of their building was welcoming and attractive. The mean of the students ($M = 4.00, SD = 0.991$) was significantly lower than the mean of the teachers ($M = 4.63, SD = 0.496$). The results of the Cohen's *d* calculation indicated a large ($d = -0.804$) effect size. The findings at Site 4 indicated that the perception of students about the inside appearance of the building was different than the perception of the teachers. The data from Site 3 also seemed to suggest that the perceptions of teachers as to what makes a building welcoming and attractive may differ from students.

Table 35

Site 4 - Group Statistics on Questions Regarding School Appearance

| Question | Group | <i>n</i> | <i>M</i> | <i>SD</i> |
|---|---------|----------|----------|-----------|
| The outside of the building is welcoming and attractive | Student | 222 | 3.91 | 1.071 |
| | Teacher | 19 | 4.26 | .653 |
| The inside of the building is welcoming and attractive | Student | 222 | 4.00 | .991 |
| | Teacher | 19 | 4.63 | .496 |

Table 36

Site 4 – Test Results for Comparison of Student and Teacher Responses on Questions Regarding School Appearance

| Question | <i>t</i> | <i>df</i> | Sig. (2-tailed) | Zero in 95% C. Int'l? | Cohen's <i>d</i> |
|---|----------|-----------|-----------------|-----------------------|------------------|
| The outside of the building is welcoming and attractive | -2.098 | 27.11 | .045 | N | - |
| The inside of the building is welcoming and attractive | -4.829 | 32.12 | .000 | N | -.804 |

As indicated in Table 37 and 38, within the category of questions regarding Safety and Security, significant differences were found between the means of the students and teachers ($t(32.78) = -4.497, p = .000$) regarding their perceptions about how safe they feel within the school building. The mean of the students ($M = 3.91, SD = 1.047$) was significantly lower than the mean of the teachers ($M = 4.53, SD = 0.513$). The results of the Cohen's *d* calculation indicated a medium ($d = -0.752$) effect size. Significant

differences were also found between the means of the students and teachers ($t(32.62) = -5.209, p = .000$) regarding their perceptions about how safe they feel when they are on school grounds. The mean of the students ($M = 3.87, SD = 1.030$) was significantly lower than the mean of the teachers ($M = 4.58, SD = 0.507$). The results of the Cohen's d calculation indicated a large ($d = -0.875$) effect size. The findings at Site 2 indicated that the perceptions of students regarding Safety and Security, both inside the building, and within the school grounds of their facility differed from the perceptions of teachers in this category.

Table 37

Site 4 - Group Statistics on Questions Regarding Safety and Security

| Question | Group | <i>n</i> | <i>M</i> | <i>SD</i> |
|-----------------------------------|---------|----------|----------|-----------|
| I feel safe in school | Student | 222 | 3.91 | 1.047 |
| | Teacher | 19 | 4.53 | .513 |
| I feel safe in the school grounds | Student | 222 | 3.87 | 1.030 |
| | Teacher | 19 | 4.58 | .507 |

Table 38

Site 4 – Test Results for Comparison of Student and Teacher Responses on Questions Regarding Safety and Security

| Question | <i>t</i> | <i>df</i> | Sig. (2-tailed) | Zero in C. Int'l? | Cohen's <i>d</i> |
|-----------------------------------|----------|-----------|-----------------|-------------------|------------------|
| I feel safe in school | -4.497 | 32.78 | .000 | N | -.752 |
| I feel safe in the school grounds | -5.209 | 32.62 | .000 | N | -.875 |

As indicated in Table 39 and 40, within the category of questions pertaining to Maintenance, significant differences were found between the means of the students and teachers ($t(35.17) = -7.182, p = .000$) regarding their perceptions about the cleanliness and functional aspects of the toilet spaces. The mean of the students ($M = 3.55, SD = 1.259$) was significantly lower than the mean of the teachers ($M = 4.68, SD = 0.582$). The results of the Cohen's d calculation indicated a large ($d = -1.152$) effect size. The findings at Site 4 indicated that the perception of students regarding some aspects of the maintenance of their facility was different than the perception of the teachers.

Table 39

Site 4 - Group Statistics on Questions Regarding Maintenance

| Question | Group | <i>n</i> | <i>M</i> | <i>SD</i> |
|--|---------|----------|----------|-----------|
| CR's are clean | Student | 221 | 4.18 | .881 |
| | Teacher | 19 | 4.58 | .607 |
| The school building and grounds are generally clean | Student | 221 | 3.97 | 1.035 |
| | Teacher | 19 | 4.37 | .955 |
| CR's are in good physical condition | Student | 222 | 4.37 | .861 |
| | Teacher | 19 | 4.42 | .692 |
| The school buildings and grounds are well maintained | Student | 222 | 4.12 | .925 |
| | Teacher | 19 | 4.42 | .507 |
| The toilet spaces are clean and functional | Student | 218 | 3.55 | 1.259 |
| | Teacher | 19 | 4.68 | .582 |

Note. CR = classroom.

Table 40

Site 4 – Comparison of Student and Teacher Responses on Questions Regarding Maintenance

| Question | <i>t</i> | <i>df</i> | Sig. (2-tailed) | Zero in C. Int'l? | Cohen's <i>d</i> |
|--|----------|-----------|-----------------|-------------------|------------------|
| CR's are clean | -2.630 | 25.04 | .014 | N | - |
| The school building and grounds are generally clean | -1.720 | 21.80 | .100 | Y | - |
| CR's are in good physical condition | -.306 | 23.04 | .763 | Y | - |
| The school buildings and grounds are well maintained | -2.305 | 29.50 | .028 | N | - |
| The toilet spaces are clean and functional | -7.182 | 35.17 | .000 | N | -1.152 |

Note. CR = classroom.

Question 2: Perceptions of Staff Regarding Student Involvement

Teaching staff for the interview phase of the study was a subset of the teachers who completed the EQES questionnaires at each site. A total of five teachers were interviewed at Site 1, three at Site 2, nine at Site 3, and six at Site 4. Qualitative data from the teacher interview sessions were analyzed to determine if any specific themes or general tendencies emerged to indicate a pattern regarding the perception of staff at each site. To maintain the anonymity of interview participants, in-text citations only identify teachers by number and site. For example, teacher number four at site one would be identified as Teacher 4.1. A full transcript of each teacher interview session is included in Appendix L.

Site 1

The interview session with the teachers at Site 1 indicated that teachers had a fairly significant role during the design process for this facility. Statements responding to the question of whether or not teachers had an adequate voice in the process also suggested that they were generally pleased with the amount of participation afforded to staff in the design of the building. In contrast however, they had little knowledge regarding the amount of student involvement during the design of their facility. As one teacher summarized, “I don’t really recall many students being involved at all... as far as involving students in the actual design of the school, I don’t know that we did a lot of that, if any” (Teacher 3.1, personal communication, November 2, 2010). A second teacher also noted, “I don’t know that students had a decision making effort” (Teacher 5.1, personal communication, November 2, 2010).

Teachers at Site 1 also exhibited a level of indifference toward the idea of student involvement in the design of the school facility. As one teacher suggested:

I don’t think it was intentional to leave students out of the planning stage. I just think it was hard for a majority of students to be able to say, you know, we need to be able to design a school that looks like this, and to be able to actually say this is the function that it’s going to serve. (Teacher 3.1, personal communication, November 2, 2010)

As a second teacher also indicated:

I don’t think that the thought was there to say let’s take a step back and start talking to kids... I think maybe when you have a larger school with a bigger

student base you would think more about the student population? (Teacher 1.1, personal communication, November 2, 2010)

Their comments seemed to suggest ambiguity, or uncertainty as to how, or when to involve students in the design process. When specifically responding to the idea of students playing a greater role in the design of school facilities, Teacher 3.1 also indicated, “I’m not necessarily saying we should exclude them from an opportunity, but at the same time, ... I don’t know how many high school students would give up a whole day just to look at buildings” (personal communication, November 2, 2010). Overall, teacher responses at Site 1 expressed both positive and negative perceptions regarding student involvement, often within the same response. As Teacher 3.1 responded to the question asking if they felt the process gave students an adequate voice, “I think we should have included students, but at the same time...” (personal communication, November 2, 2010).

Teachers at Site 1 pointed to the lack of experience, or the immaturity of students as a reason for questioning the validity of student perceptions. As one teacher indicated, “I don’t know that they have the maturity level for the actual design” (Teacher 2.1, personal communication, November 2, 2010). Some teachers expressed even stronger reservations.

What kind of attention span do they have for it? Do they have more than 10 or 15 minutes looking at it and say okay, now I’m bored and want to go do something else... I think that’s what it comes down to. (Teacher 3.1, personal communication, November 2, 2010).

Perceptions regarding student involvement among the teachers at Site 1 were varied. When responding to the question asking whether students should play a greater role in the design of school facilities, some responded favorably. As one teacher suggested, “I think students have great input” (Teacher 5.1, personal communications, November 2, 2010). In responding to the question soliciting suggestions for changes to improve the design process of future schools, Teacher 3.1 indicated that student involvement should be placed at the top of the list (personal communication, November 2, 2010).

Site 2

The teachers interviewed at Site 2 also indicated that they had a fairly significant role during the design process for this facility. Statements responding to the question of whether or not teachers had an adequate voice in the process suggested that they were generally pleased with the amount of participation afforded to staff in the design of the building. However, in recalling the process from their perspective, teachers at this site also pointed out that there was limited student involvement during the design of their facility, involving only a handful of student leaders. As Teacher 1.2 concluded, “there may have been a little bit of involvement, but probably in the big picture very little, and probably very cursory, or preliminary” (personal communication, March 15, 2011). As further indicated by the teachers during the interview session, the student involvement in the design process was limited to the non-academic areas of the school.

The teachers at Site 2 also pointed to the lack of experience, or the immaturity of students as a reason for questioning the validity of student perceptions. When identifying the reason for limited student involvement in the design of their facility, one responded

“I’d have to say that being that you were going to bring in 9th-graders or 10th-graders, how much of it could they really have gotten into? They wouldn’t have been able to design the biology lab...” (Teacher 1.2, personal communication, March 15, 2011).

In response to the question asking if students had an adequate voice in the design of their facility, one teacher expressed a clear bias against the idea of student involvement. Teacher 2.2 indicated that:

I wasn’t necessarily looking for student input in Science. We tend to think we know it all, as what we’ve taught in the classroom. We have multiple years of experience in that science classroom, and to ask students to say well what does or doesn’t work in their one hour that they were in your classroom for a year, while it could be important, I can say from my standpoint I wasn’t looking for it necessarily, good or bad. (personal communication, March 15, 2011)

Site 3

The interview session with the teachers at Site 3 indicated mixed opinions regarding the role that teachers had during the design process for this facility. While some indicated that they had a very strong involvement and had a significant voice in the process, others seemed to feel that they were excluded or not adequately involved in the process, and had too little a voice in the shaping of their classrooms. Again however, the teachers interviewed indicated that they had little knowledge regarding the amount of student involvement during the design of their facility. Student involvement, from the teacher’s perspective, was again limited to a small group of students, and seemed limited to non-academic areas. As one teacher summarized, “I do know that the principal had selected a handful of student leaders. I don’t know other than some cursory things off the

top of their head, that they thought they would like to see...” (Teacher 3.3, personal communication, February 16, 2011).

Perceptions regarding student involvement among the teachers at Site 3 were somewhat varied. Teachers specifically questioned the maturity level of students. As one teacher suggested, when asking students about what they would want in a classroom “you have to take it with a grain of salt, because they are kids and they’re not going to be happy no matter what” (Teacher 7.3, personal communication, February 16, 2011).

At least one response also suggested the perception that the student voice should be secondary to, perhaps even over-shadowed by, teacher input. As Teacher 8.3 concluded, when you are dealing with something of the size and complexity of a high school, “you’re going to leave something like that up to the professionals” (personal communication, February 16, 2011).

Site 4

Teachers at Site 4 also indicated that teachers had a fairly significant role during the design process for this facility. Statements responding to the question of whether or not teachers had an adequate voice in the process suggested that they were generally pleased with the amount of participation afforded to staff in the design of the building. In contrast however, they seemed very confident that there had been little, if any, student involvement in the design of their school. They also expressed very strong bias against the need for student involvement. As one teacher suggested:

I think I know best as to my room, and what my room needs to be laid out, ... Do

I want student input from a 9th or 10th grader who don’t know anything about

what we do? No, I don't. I don't want their input. (Teacher 1.4, personal communication, May 25, 2011)

The teachers indicated that the basis for their hesitancy to include students was related primarily to the type of spaces they taught in. As Teacher 1.4 further indicated, “especially when it comes to specialized areas like us, electronics, culinary, business... I don't want student input from a kid who don't know our area” (personal communication, May 25, 2011).

Teachers at Site 4 also pointed to the lack of maturity as a basis for questioning the need for student involvement. As one teacher indicated, “they're still very, too immature to make those decisions. ...and they don't even tuck in their chair, so we wouldn't even want to open that door” (Teacher 3.4, personal communication, May 25, 2011). The teachers at Site 4 did however speak to the validity that a student might have after several years away from high school, suggesting that college, or some form of work experience would enable them to provide insight. As Teacher 5.1 concluded:

Except for a student who went to college and then came back, because they would see it in a different perspective than I would, and they would have more experience and be definitely serious in that field. So yeah, that would be big input there. But beyond that, 9th, 10th, 11th? Nah. (personal communication, May 25, 2011)

Without the maturity and insight that would come from experiences beyond their high school years, teachers at Site 4 made it clear that they saw no purpose in involving

students in the design process, especially in the more complex vocational areas of the facility.

Common Perceptions Among Teachers Across All Four Sites

Qualitative data from the interview sessions were also analyzed to determine if any specific themes or general tendencies emerged from the statements made by the teachers to indicate a pattern regarding the perception of staff across all four sites. As Leedy and Ormrod (2009) suggested, the analysis was intended to determine “a general sense of patterns—a sense of what the data mean” (p. 150). Statements from the interview sessions suggested up to five common perceptions regarding the idea of student involvement among the teachers at all four sites including, (1) indifference toward the idea, (2) questions regarding the maturity level of students, (3) reserved interest, if limited to non-academic areas, (4) receptivity to the idea, or (5) a bias against the idea. Table 41 indicates the number of statements that correspond to each perception by site. A summary of the teacher statements identified for each of the observed perceptions is provided in Appendix O.

Table 41

Perceptions Among Teachers Regarding Student Involvement

| Perception | Site Number | | | | Total |
|-------------------------|-------------|---|---|---|-------|
| | 1 | 2 | 3 | 4 | |
| Indifference | 3 | 2 | 0 | 0 | 5 |
| Question maturity level | 5 | 2 | 3 | 3 | 13 |
| Reserved interest | 2 | 2 | 1 | 1 | 6 |
| Receptive | 4 | 2 | 0 | 0 | 6 |
| Bias against | 0 | 2 | 1 | 7 | 10 |

As indicated in Table 41, a total of 13 statements from the teacher interviews suggested that perceptions regarding the *maturity level* of students were the most prevalent reason for teachers to question the involvement of students in the design of school facilities. In addition to being the most prevalent perception, it also occurred at all four sites. Statements indicating a perception of *reserved interest* were also observed at all four sites. While there were a total of 10 statements regarding a *bias against* the idea of student involvement, it was not common to all four sites, and 7 of the 10 statements occurred at Site 4. Perceptions indicating that teachers were either *receptive* to or had *indifference* toward the idea of student involvement occurred with the least frequency, and were also only observed at Site 1 and 2.

Question 3: Perceptions of Principals Regarding Student Involvement

The current principal of the facility was utilized for the principal interview at each site. With the exception of the principal at Site 4, all principals that were interviewed

served in the principal role during the design phase of the new facility. The retired principal, who had served in the principal role during the design phase, was also interviewed at Site 4 in a session separate from the current principal's interview. A total of five principals were interviewed. To maintain the anonymity of interview participants, in-text citations only identify principals by number and site. For example, principal number one at site four would be identified as Principal 1.4. A full transcript of each principal interview session is provided in Appendix M.

Qualitative data from the principal interview sessions were analyzed to determine if any specific themes or general tendencies emerged from the data to suggest a specific pattern regarding the perceptions of the principal at each site. The collective responses of all principals were also analyzed to determine if, in a broader setting across all four sites, a common pattern of perceptions occurred. The focus of the analysis was intended to gain a general understanding of the framework utilized by principals to gain input from stakeholders during the design and planning process.

Site 1

Despite feeling that the principal's role during the design process was not clearly defined, the interview at Site 1 revealed that the principal was given the primary responsibility for engaging staff in the design of their new facility. As Principal 1.1 indicated, after gaining insight from members of the community, the district indicated they were ready "to hear from staff" (personal communication, January 9, 2011). Based on direction from the architects for the project, Principal 1.1 enlisted teachers to participate in the design process.

I think the architects led us to having teachers involved in this. They helped us set that up. This is how most schools do it. You know, who is in charge of your class? ... If you're designing a classroom, really it's everybody, but I picked a few teachers, and that's how it started initially. (Principal 1.1, personal communication, January 9, 2011)

In retrospect, the principal seemed concerned about the fact that no protocols were established before the process of stakeholder involvement began. In responding to the question on improving the design process of future schools, Principal 1.1 noted when designing classrooms:

you sit down with a teacher who's been teaching English for 20 years, and you say what would you like your classroom to be, they would pretty much describe the classroom that they already have. So, that's why I keep emphasizing protocols. If you extract from that individual what he or she values, what he or she envisions as good teaching, and you will probably come up with a different design. (personal communication, January 9, 2011)

As Principal 1.1 concluded, if better protocols had been established, "we probably would have developed more flexible classrooms, more moveable walls, spaces that could change" (personal communication, January 9, 2011).

In suggesting ways to make the design process more effective, this principal also specifically looked to the architect to bring a level of expertise to the process, and if necessary augment the process with individuals who can assist in the development of new schools. As Principal 1.1 concluded:

This was our first crack at this as administrators and board members. I do hold them accountable, the architect in particular, I think they should have (been) more accountable to the expertise, the educational expertise and how we arrive at that. (personal communication, January 9, 2011)

The architect, from this principal's perspective, was the one who should lead the process, and help to establish the protocols used to make design decisions.

The principal at Site 1 seemed to express ambiguity, or uncertainty regarding student involvement in the design process. While Principal 1.1 saw value in the contribution of student input into the non-academic areas of the facility, they were not "comfortable with them making some of the classroom decisions, and I just frankly didn't include them" (personal communication, January 9, 2011). This principal openly admitted to deferring the decisions about the design of the classroom to staff rather than students. As Principal 1.1 concluded, "Classrooms, we didn't give them much of anything. That was very much an adult-driven process" (personal communication, January 9, 2011). However, in recalling the efforts made to involve students, Principal 1.1 seemed very positive about the positive impact it had on the process. "I would get their feedback on what they liked. So, that was a pretty cool moment for me, because I did appreciate... their feedback was very genuine and I think they felt very good about what they could offer..." (personal communication, January 9, 2011).

Principal 1.1 also indicated that students were under-represented in the design of their facility. "If I had to do it all over again, I would seek more input" (Principal 1.1, personal communication January 9, 2011). Again however, this principal concluded this would require established protocols, and adults to guide the process. In recalling their

efforts to involve students, this principal concluded it had occurred quite randomly, and without planning. Overall the principal at Site 1 concluded that “We kind of left them out. I would say they were under-represented. I would like to represent them more” (Principal 1.1, personal communication, January 9, 2011)

Site 2

Principal 1.2 indicated that they had a key role in the planning process of the Site 2 facility. As the person making decisions about when and how to involve students in the process, Principal 1.2 pointed out that “students were involved and were able to give their opinions as to what they might be looking for in student areas” (personal communication, April 5, 2011). Student areas were further defined by the principal as common areas such as the cafeteria. Overall Principal 1.2 believed that “students had adequate representation, and gave input to areas they were knowledgeable about, or which they felt were of the utmost importance to them” (personal communication, April 5, 2011). This principal clearly expressed the perception that student input was only valid in certain areas, and not at the same level of importance as the teacher’s perspective.

In describing the role of stakeholder involvement during the design process at Site 2, Principal 1.2 suggested that “The greatest voice really came from the expertise of the teachers” (personal communication, April 5, 2011). When asked about the validity of student perceptions, Principal 1.2 again gave priority to the teacher’s perspective.

The teachers spoke from a teaching point of view, in terms of content, in terms of maximizing learning... That in my opinion probably carried the most weight... I

think there is a weighting, and you know, you want to allude first to those who have the experience. (personal communication, April 5, 2011)

By selecting student leaders to participate in meeting to discuss specific areas of the building, the principal concluded that they had given students an adequate voice in the design of the facility at Site 2, and that they had not been under-represented in the planning process.

Site 3

Principal 1.3 seemed very pleased with the process that had been utilized to plan and design the Site 3 facility. The interview revealed that this principal viewed stakeholder involvement as their primary role in the process. As Principal 1.3 concluded:

It was not just what my vision is. Meeting the student and community needs, I felt like my role was to get others involved. Not just my own voice. I think my own voice was heard, of course, but, I really felt as though everything was laid out that I could involve others too. (personal communication, February 16, 2011)

As this principal concluded, even though it wasn't possible to get everyone involved, all stakeholders were adequately represented in the planning process for their facility.

Representatives from various teaching departments, and student leaders had been selected to participate in the process.

The principal indicated that the student voice had a significant role in the design of their facility. As Principal 1.3 concluded:

I think their input really ended up in the design of this high school, and I think it made it better in my opinion. So, the process was there, it was encouraged. I felt like, not just from our architects, but even from our central office, and from me.

We need to make sure they have input, not just for input, but I really think some of their ideas made this building better. (personal communication,

February 16, 2011)

While given a prominent voice, student involvement in the design of the facility seemed to again, as observed at the other sites in this study, be limited to the non-academic areas of the building. The principal cited examples pertaining to commons areas, lockers, and cafeteria. No references were made by this principal during the interview to examples where student voice had specifically impacted classroom areas.

In reflecting on whether students may have been under-represented during the planning and design process, Principal 1.3 indicated that he probably could have done a better job of broadening student involvement. “Now in picking the student leaders, could we have missed the boat? Like the voice of the kids who weren’t the student leaders, I bet we probably did” (Principal 1.3, personal communication, February 16, 2011). In retrospect, this principal suggested that there may have been benefit in seeking a greater audience.

Site 4

The initial principal interview at Site 4 was conducted with the principal who was serving the facility as principal at the time of this study. Since Principal 1.4 was not the principal at the time of the planning and design of this facility, an effort was made to locate and also interview the principal who served in this capacity. A subsequent, and separate, interview for Site 4 was conducted with Principal 2.4.

Principal 1.4 shared limited responses to the interview questions due to their lack of involvement in the planning and design process at Site 4. They did however express a

strong bias against the need for student involvement. When asked if student perceptions were valid, Principal 1.4 suggested:

I really don't see any purpose in seeking student involvement during the planning process of a high school. Like my teachers, I would have to question the maturity level of high school students, and their ability to provide meaningful input.

(personal communication, May 25, 2011)

Principal 1.4 expressed specific candor about the perception that students were not likely to contribute to the design and planning process.

In the second interview for Site 4, Principal 2.4 shared specific details regarding their role from the earliest stages of the programming of this facility all the way through to occupancy. Principal 2.4 also provided detailed information regarding the involvement of staff during the planning and design phases of the project. As the one tasked with bringing stakeholders to the process, Principal 2.4 confirmed that teacher input was heavily involved in the design of the facility at Site 4. However, when asked about the efforts made to involve students in the process, they revealed it was something that may have been overlooked during the early stages of development. As Principal 2.4 recalled, "In the initial phase there weren't, and maybe that's a problem, but we were into something so new that I just didn't think about it" (personal communication, October 27, 2011).

When they felt the appropriate time came for student input, Principal 2.4, in similar fashion to what was recorded at other sites, sought their input in what were again deemed student or non-academic areas. "Yes, we listened to what the kids had to say in terms of things like hallway widths, lockers: things that we felt they knew about"

(Principal 2.4, personal communication, October 27, 2011). Principal 2.4 also referred to specific items that students had input on such as the cafeteria area and lighting.

Principal 2.4 also expressed the perception that students may not have been able to provide valuable insight. As to the rationale for the student's under-representation in the process, Principal 2.4 indicated:

If there was a reason, it was because time was of the essence, and I didn't think that, at certain points, I didn't think we would gain anything by their input, but you've got to remember this was a specialize school. At a regular high school, we probably should listen more to the kids. (personal communication, October 27, 2011)

In providing further insight regarding the perceptions they held about student involvement, Principal 2.4 shared:

Sometimes it's valuable, and sometimes it's not. That's the way I kind of feel about it, and maybe that's a little uppity, but I think at some point you need to roll with the people you think you can get the most information out of, and the most data out of to move forward with the project. (personal communication, October 27, 2011)

Overall, Principal 2.4 seemed willing to afford students the opportunity to participate, but had a reserved expectation regarding their ability to contribute to the process.

One additional insight that Principal 2.4 shared regarding student involvement was the impact the setting that they are invited to participate in may have on their ability to contribute. In recalling planning sessions where students had been invited, Principal 2.4 recalled:

It's not like we didn't have kids sitting there. The comments we would get from kids after the meeting, they would come into my office the day after the meeting and go, there were two school board members there, the superintendent was there... What was I supposed to say? You know, they just wanted to fade into the woodwork at that point... but kids don't feel comfortable in those kinds of situations a lot of times, and I'm not sure they should be put in those situations.

(personal communication, October 27, 2011)

This principal's observation suggested the need to carefully consider the format and structure of the planning and design meetings we include students in.

Common Perceptions Among Principals Across All Four Sites

Qualitative data from the interview sessions were also analyzed to determine if any specific themes or general tendencies emerged from the statements made by the principals to indicate a pattern in the perception across all four sites. Statements from the interview sessions suggested up to four common perceptions regarding the idea of student involvement among the principals of all four sites including, (1) receptivity to the idea, if limited primarily to non-academic areas, (2) that it was secondary to the teacher, or adult input, (3) that it could be done better on future designs, or (4) a bias against the idea.

Table 42 indicates the number of statements from the principals that correspond to each of these perceptions by site. A summary of the principal statements identified for each of the observed perceptions is provided in Appendix P.

Table 42

Perceptions Among Principals Regarding Student Involvement

| Perception | Site Number | | | | Total |
|------------------------------|-------------|---|---|---|-------|
| | 1 | 2 | 3 | 4 | |
| Receptive, if limited | 5 | 3 | 2 | 2 | 12 |
| Secondary to teachers/adults | 3 | 2 | 0 | 1 | 6 |
| Could do better in future | 3 | 0 | 1 | 1 | 5 |
| Bias against | 1 | 0 | 0 | 3 | 4 |

As indicated in Table 42, a total of 13 statements from the principals indicated that they were receptive to the idea of student involvement in the design process, if limited primarily to the non-academic areas of the facility. In addition to being the most prevalent perception, it also occurred at all four sites. Principals at three of the four sites also suggested that student input carried less weight than the input of teachers, especially when considering the design of instructional areas. While the interviews revealed some bias among the principals toward the idea of student involvement, in general, a phenomenon of reserved interest was observed among all of the principals interviewed in this study.

Question 4: Perceptions of Architects Regarding Stakeholder Involvement

A representative from the architecture firm involved in the design of each facility was interviewed. The architect for each site was selected based on their involvement during the design and programming phases of the project. A total of four architects were interviewed in a separate session for each site. In addition to the interview script

questions, the researcher concluded each interview by asking the architect to summarize their perception of the impact, given as a numerical percentage of the total, that each stakeholder, as individuals or a group, had on the overall design of the facility at their site. Qualitative data from the architect interview sessions were analyzed to determine if any specific themes or general tendencies emerged from the data to suggest a specific pattern regarding the perceptions of the architect for each site. The collective responses of all architects were then analyzed to determine if, in a broader setting among all four sites, a common pattern of perceptions occurred. The focus of the analysis was intended to gain a general understanding of the organizational methods utilized by architects to gain input from stakeholders during the design and planning process. To maintain the anonymity of the interview participants, in-text citations only identify architects by site. For example, the architect at site one would be identified as Architect 1. A full transcript of each architect interview session is provided in Appendix N.

Site 1

Architect 1 served as the Project Manager for the architectural firm responsible for Site 1. Based on the description of their role in the planning process used for the facility at Site 1, the architect held a key role in the project. They were actively involved with stakeholders throughout the planning and design process, and interacted heavily with the principal and teachers regarding the design of the building. The architect indicated that school administration was responsible for choosing the leaders from among the faculty to participate in the process. As Architect 1 suggested, “From my perspective, there was no one missing from our experience. If there were staff people not there, we

would have raised flags and felt uncomfortable, but the representation was complete enough to do the job well” (personal communication, January 19, 2011).

The architect indicated that they did not have any direct involvement with students during the design and planning process of Site 1. As Architect 1 noted, “I think, always in the wings, is the potential to involve students. They were certainly the obvious constituency not at the table...” (personal communication, January 19, 2011). This architect did however believe that students were indirectly represented in the process. “I think philosophically the design team, and I would imagine everyone involved, saw themselves as being advocates for students, at the same time being responsible educators for shaping this environment” (Architect 1, personal communication, January 19, 2011).

This architect also acknowledged the efforts of the principal at Site 1 to engage students in the process, even though they were not directly involved in any planning sessions held with the architect. Student input was something that had occurred informally, and outside of the planning and design meetings conducted by the architect. In assessing the impact that students had on the design of the facility, Architect 1 concluded, “I would say that I’m not aware of them directly, but I certainly know it happened through the staff” (personal communication, January 19, 2011).

While Architect 1 expressed an interest in greater student involvement in the planning and design process on future assignments, they also suggested that it would require “the will to engage students by the faculty and administration... I think you would need a commitment from all of the traditional stakeholders to open up and take risks” (Architect 1, personal communication, January 19, 2011). The architect clearly indicated a perception that there is certainly an opportunity for increasing the level of

student involvement. As Architect 1 concluded, “To do the effort justice, I would look forward to having a meaningful dialogue with the leadership in a school district about involving students as sort of an agenda item” (personal communication, January 19, 2011).

In summarizing the impact that stakeholders had on the overall design of the facility at Site 1, Architect 1 provided the data shown in Table 43. As indicated, the architect’s impact was significant on this facility, with similar levels of influence coming from the principal, staff, and the district’s administration and school board members. At just two percent of the total impact, students contributed at the lowest level among all of the stakeholders mentioned by Architect 1.

Table 43

Architect’s Summary of Stakeholder Impact at Site 1

| Stakeholder | % of Total |
|---------------------------------|------------|
| Principal | 13 |
| Architect | 50 |
| Staff | 15 |
| Students | 2 |
| Administration and School Board | 20 |

Site 2

Architect 2 served as the Lead Designer and Project Administrator from the architectural firm responsible for Site 2. This architect also outlined the significance of the role they played during the planning and design process of the facility at Site 2. The architect facilitated the programming efforts on the project by working with a committee

made up of teachers, board members, and students. They indicated that there were a total of approximately 23 people involved in the programming process. As Architect 2 noted, “For the most part, the selection was done by the school district, them knowing who would be best to participate, who would be open minded about the process” (personal communication, April 13, 2011).

This architect described a planning and design process that was heavily influenced by the teaching staff at Site 2. As Architect 2 indicated:

I think they got a lot of input actually, and we took a lot of effort to do that. We also had global presentations to the entire staff. We would go to staff meetings and give them progress updates of where we were at, and get some input from that. (personal communication, April 13, 2011)

While the architect indicated that students had also been involved, it was described as secondary to the teacher voice on this project.

In describing the efforts to include students in the planning and design process, the architect indicated that the time and effort needed to participate in the process became a constraint for students. They pointed to the efforts that some staff made to include students in the design of certain classroom areas, specifically in the music and band areas of the facility. As Architect 2 noted, “sometimes you rely on the faculty to help you get that input” (personal communication, April 13, 2011). Students were also identified as having had an impact on the design by influencing the decision to place the cafeteria adjacent to media center of the facility. However, as Architect 2 concluded, “I think if I had the opportunity to do it over again, I would push the district to involve more students” (personal communication, April 13, 2011).

In summarizing the impact that stakeholders had on the overall design of the facility at Site 2, Architect 2 provided the data shown in Table 44. As indicated, from the architect’s perspective, the teacher’s had the greatest impact on this facility. The architect and principals had the second and third highest level of influence on the design. They also suggested that the superintendent, board members, and facility managers all had similar levels of influence on the project. At just five percent of the total impact, students contributed at the lowest level among all of the stakeholders mentioned by Architect 2.

Table 44

Architect’s Summary of Stakeholder Impact at Site 2

| <u>Stakeholder</u> | <u>% of Total</u> |
|--------------------|-------------------|
| Superintendent | 10 |
| Board Members | 10 |
| Principals | 15 |
| Teachers | 30 |
| Students | 5 |
| Facility Managers | 10 |
| Architect | 20 |

Site 3

In describing their role as the Project Manager from the architectural firm responsible for the design of Site 3, Architect 3 outlined their role as (a) a facilitator of conversations, (b) the one responsible for leading participants through the process, (c) the person who had to ask the right questions, (d) keeping everyone informed throughout the process, and (e) advising the school district regarding the right players, or decision

makers that needed to be included in the process (Architect 3, personal communication, April 20, 2011). The architect described a process that was very inclusive, and encouraged by the school district's leadership. As Architect 3 noted, "I think the superintendent was instrumental in implementing a philosophy of being very inclusive" (personal communication, April 20, 2011).

The architect indicated that the design of the facility had been heavily influenced through stakeholder involvement. As Architect 3 noted, "I think the process was fairly inclusive, even more so than other projects I have worked on" (personal communication, April 20, 2011). This presented some challenges for this architect, perhaps even pulling the design solution away from possible changes. As Architect 3 concluded:

I do think the design was heavily teacher-oriented, and I found their desires are not generally education focused. It's about supervision, and it's about them staking out their territory. Some of the ideas we made about changes to the educational environment we met with real resistance. (personal communication, April 20, 2011)

Despite the efforts on the part of the district to encourage stakeholder involvement, the architect suggested that if any group was under-represented, it was probably the students.

This architect considered student involvement to have been relatively minor, and as also observed at the other sites in this study, their input was limited to the non-academic areas of the facility. As Architect 3 suggested, "looking back I think student involvement would have been better: probably would have led to some different solutions on things" (personal communication, April 20, 2011). The student voice was believed to have come indirectly to the architect during the planning and design process, primarily

through the principal or teachers, or as Architect 3 concluded, their interpretation of the student voice.

While the architect expressed an interest in greater student involvement on future projects, they also believed that students may have difficulty verbalizing their ideas. As Architect 3 suggested, “We might, as the architect maybe, need to lead that discussion and have somebody skilled in sort of drawing out from them things, but it’s almost like they need something to respond to, and then work from there” (personal communication, April 20, 2011).

In summarizing the impact that stakeholders had on the overall design of the facility at Site 3, Architect 3 provided the data shown in Table 45. As indicated, the architect’s impact was significant on this facility, with an equal amount of influence coming from the teaching staff. Students were not indicated as one of the stakeholders who contributed to the design of the facility at Site 3.

Table 45

Architect’s Summary of Stakeholder Impact at Site 3

| <u>Stakeholder</u> | <u>% of Total</u> |
|--|-------------------|
| Superintendent | 10 |
| Principal | 10 |
| Architect | 30 |
| Staff | 30 |
| <u>Administration and School Board</u> | <u>20</u> |

Site 4

This architect described their role as the Lead Designer of the facility at Site 4. As Architect 4 noted, “It was my responsibility to work with the principal and his team to develop the program and design for the facility” (personal communication, April 26, 2011). As the architect recalled, the principal of the building was heavily involved in the design and planning process, and was also the person responsible for assembling the team of stakeholders, made up primarily teachers and administrators, who would be involved in meetings with the architect.

This architect outlined a planning and design process that had been heavily influenced by teachers from specific subject areas. As Architect 3 noted, “Some were very involved, very enthusiastic, very proactive. Others were kind of more reactive, so it varies, and that’s typical. We never get every teacher the same” (personal communication, April 26, 2011). They indicated that if any particular voice may have been lacking from the planning and design process at Site 3, it was probably the voice of outside experts. As Architect 3 concluded, “I should have brought in more outside expertise, in educators, specialists from the university level who would challenge the educational paradoxes” (personal communication, April 26, 2011).

In assessing the level of student involvement at Site 4, the architect considered the principal’s attempts to include students significant, but again, limited to the non-academic areas of the facility. As Architect 3 noted, “what the students did was championed the more industrial, raw approach to the interior” (personal communication, April 26, 2011). Architect 3 viewed the student voice as being inadequate during the design and planning of the facility at Site 4, “because it wasn’t formalized... They

weren't really actively involved in the design of the school" (Architect 4, personal communication, April 26, 2011). As Architect 4 noted, instead they were asked to react to plans as they were developed.

In describing how students might play a greater role in the design of school facilities, Architect 4 suggested that students would have to be trained to participate effectively in the design process. They envisioned a process that included students participating in tours of other facilities, as well as research regarding unique projects, prior to their involvement, to allow them to better understand the programming and design process they would be asked to participate in. As Architect 4 concluded, "If you're going to involve students in the design, that you have to give them something to base it on. Involve them in the research, and train them" (personal communication, April 26, 2011).

In summarizing the impact that stakeholders had on the overall design of the facility at Site 4, Architect 4 provided the data shown in Table 46. As indicated, the architect's impact, acting jointly with the principal, had a significant impact on this facility. According to Architect 4, students contributed at the lowest level among all of the stakeholders mentioned at Site 4, and their impact was again qualified as having been "reactive" (personal communication, April 26, 2011).

Table 46

Architect's Summary of Stakeholder Impact at Site 4

| Stakeholder | % of Total |
|-------------------------|------------|
| Architect and Principal | 51 |
| Teachers | 20 |
| Students | 5 to 10 |
| Others | 24 to 19 |

Common Perceptions Among Architects Across All Four Sites

Qualitative data from the interview sessions were also analyzed to determine if any specific themes or general tendencies emerged from the statements made by the architects to indicate a pattern in the perception across all four sites. Statements from the interview sessions suggested up to four common perceptions regarding the idea of student involvement among the architects of all four sites including, (1) very receptive to the idea, (2) that cooperation would be required from the administrators and educators to make it happen, (3) that it may require additional training, and outside assistance from experts to be effective, or (4) student interests and needs are being represented by the staff, or other adult participants in the process. Table 47 indicates the number of statements from the architects that correspond to each of these perceptions by site. A summary of the architect statements identified for each of the observed perceptions is provided in Appendix Q.

Table 47

Perceptions Among Architects Regarding Student Involvement

| Perception | Site Number | | | | Total |
|---|-------------|---|---|---|-------|
| | 1 | 2 | 3 | 4 | |
| Very receptive to the idea | 3 | 3 | 2 | 2 | 10 |
| Would require cooperation from educators | 2 | 1 | 1 | 1 | 5 |
| May require additional training and expertise | 1 | 0 | 1 | 3 | 5 |
| Student interests being represented by adults | 6 | 1 | 1 | 1 | 9 |

Perceptions Across All Interview Groups and Sites

One encouraging finding was observed as a common perception across all interview groups, and at each of the four sites. Participants at each site shared statements that expressed receptivity to the idea of student participation during the design and planning phases of a school facility. Statements indicating a level of receptivity to student involvement appeared to be strongest among architects, present with some reservations among the principals, and even more reserved among teachers. However, the interview sessions also revealed numerous statements expressing reservations, and even stronger levels of bias against the idea of student involvement among the teacher and principal participants. No statements expressing bias toward the idea was indicated by the architects interviewed. As shown in Table 48, there were a total of 28 statements made expressing receptivity to the idea of student involvement, but also a total of 14 statements made expressing a bias against the idea. In summary, the overall sample of adult

interview participants indicated mixed perceptions regarding student participation in the design and planning stages of school facilities. The findings of this study seemed to suggest the need for providing a clear and distinct understanding of the possible benefits of student involvement among the architects and educators who are given the responsibility for overseeing the design and planning efforts of a school facility.

Table 48

*Common Perceptions Among All Interview Participants
Regarding Student Involvement*

| Perception | Number of Statements Made By | | | Total |
|-----------------------|------------------------------|------------|------------|-------|
| | Teachers | Principals | Architects | |
| Receptive to the idea | 6 | 12 | 10 | 28 |
| Bias against | 10 | 4 | 0 | 14 |

Conclusions

The purpose of this mixed-methods study was to explore the perceptions of principals, teachers, and architects regarding the involvement of students in the design and planning process of new school facilities. It was also intended to provide a better understanding of the potential benefits from seeking student involvement during the early stages of the process. The EQES questionnaires were utilized during the initial phase of this study to identify any differences in the perceptions of the two participant groups: teachers and students. The second component of research involved interviews among participants from the same four high schools utilized for the initial survey research. The primary intent of the interview portion of the study was to determine (a) if students were given a meaningful voice in the design process of the new school facilities, and (b) if not,

was their lack of participation due to a perceived lack of credentials or ability to provide meaningful contributions to the process.

The first research question asked: What are the perceptions of educators (teachers), and students in a grade nine through twelve high school setting regarding the physical design characteristics of their learning environment?

Results of the independent-samples *t* test analyses revealed significant statistical differences between student and teacher perceptions at three out of the four sites in this study. The findings of this study support the conclusion of Ahrentzen and Evans (1984) who indicated, “it is clear that students and teachers respond differently to classroom design features” (p. 450). Ahrentzen and Evans further suggested that “Classroom innovation, however, is not the sole property of the architect. Students and teachers can become more involved in creating and changing their environments” (p. 452).

The findings of this study also compliment the research of Doppelt (2006), and Fraser (1982) indicating the clear differences between student and teacher perceptions regarding classroom environments. As Konings, et al. (2007) observed, “the need to pay more attention to students’ perspective on educational design is further strengthened by research showing that striking differences do exist between students’ and teachers’ perceptions” (p. 446) Specific areas where student and teacher perceptions differ were observed in the categories of (a) learning spaces, (b) school appearance, (c) safety and security, and (d) maintenance. Recognizing the differences in student and teacher responses suggests a clear need for involvement of both parties in the design of new facilities. Architects and educators may be able to gain valuable, and differing, input from students during the design and planning process of a new high school facility. As Flutter

and Ruddock (2004) concluded, “research leads us to believe that practitioners and schools can benefit from tuning into pupils’ perspectives” (p. 3). While the efforts to consult pupils may present new challenges, the potential benefits seem to outweigh the difficulties.

The second research question asked: What perceptions do educators (teachers) in a grade nine through twelve high school setting have regarding the validity of student involvement as a source for input and recommendations regarding the design of new high school facilities?

The Teaching Staff Interview session at all four sites indicated that in general, teachers were given a significant level of opportunity to shape their facilities, and specifically provided the opportunity to impact the physical characteristics of the classroom areas. Although there were some exceptions voiced by individual teachers at two of the four sites, the predominant feedback from teachers indicated that they had an adequate voice in the planning and design process for their facility. The evidence from this study of four recently completed high school facilities suggested that a pattern of stakeholder involvement, specifically teachers, is being accomplished.

The teaching staff interviews conducted during this study revealed that most teachers did not have a great deal of knowledge regarding the level of student involvement that occurred during the design of their facilities. However, as highlighted in Table 41, they were fairly consistent in raising questions regarding the value or purpose in seeking student input. The findings of this study also exhibited a pattern of teachers who believed that the maturity level of students would prevent them from being meaningful participants in the design and planning process. Taylor (2000) suggested that

further research, including “the analysis of school sites using multiple voices as compared to research findings of a quantitative nature” (p. 45), could ultimately benefit the design process used for the design of school facilities. If nothing else, the teaching staff interviews conducted for this study supported this concern: “Most often, no one has considered asking for direct meaningful student input when planning new or renovated school buildings” (p. 45).

Newman and Thomas (2008) suggested that “children are competent and active members of society, who can and should have a say in aspects of social life that concern them” (p. 238). Despite historical doubts of the ability to obtain meaningful input from children and young people, new discoveries challenging these assumptions support the idea of including them in the design and planning process of school facilities. While the perceptions among the teachers interviewed in this study ranged dramatically from, (a) an interest in seeking additional student involvement to, (b) a clear bias against the idea of asking for any student input, one conclusion seemed to emerge: some teachers will need to be educated regarding, if not convinced of, the merits of seeking student input in the design of school facilities.

The third research question asked: What are the perceptions of high school principals regarding the involvement of students in the design of a new high school facility?

The Principal Interview sessions indicated that the principal at each site had a significant role in working with the architectural firm during the programming and design process at all four sites. All four principals were an important decision maker in determining which stakeholders would be included. There was a high degree of interest,

and effort on the part of all principals to include teachers, specifically regarding the design of the classroom areas. All principals suggested that they had made attempts to incorporate students in the design and planning process of their facility. However, as indicated in Table 42, while students were not excluded from the design and planning process, they were in most cases limited by the principals to only providing input regarding the non-academic areas of their facility. As a result, students had limited, or secondary impact on the design of their school.

If students are to realize a greater impact from new school facilities, they must receive adequate representation during the design process. As suggested by the CELE Exchange (2009):

It is perhaps self-evident that if students are central to learning and the mission of schools, then they would have a lot to say about their school environments.

However, the call to ‘listen to student’ in the Future Scotland Debate suggests that it still does not happen. (¶ 2)

The findings at all four sites included in this study reinforced the concern that students are, in many cases, under-represented in the design of school facilities. As Abend et al. (2006) indicated, “case studies show that involving multiple stakeholders... in the design, planning, and management of educational spaces can have a positive impact on student motivation and educational outcomes” (p. 12). If student input is limited to the non-academic areas of their facility, as was observed in this study, it may be difficult to realize improved learning environments.

Burke and Grosvenor (2003) suggested that children and young people are capable and entitled to help shape school facilities. The authors concluded that “if schools

are to be a successful vehicle for learning in the twenty-first century, it is essential that young people are involved in determining their nature, design, organisation, ethos and use” (p. 9). Even though, as Newman and Thomas (2008) suggested, “children are competent and active members of society, who can and should have a say in aspects of social life that concern them” (p. 238), the findings of this study indicated that the educators who are being assigned the responsibility for including stakeholders in the design and planning process may not have the appropriate knowledge or expertise required to adequately involve students in the design and planning process of schools. As Newman and Thomas indicated, students have the capability "to comprehend issues that have often been thought too complex for them, or are conceptualized as simply not their concern” (p. 249). The perception of the principals interviewed in this study validated this misconception. They also reinforced the idea that “schools are not provided with sufficient guidance or methods to enable student participation in the design of new schools” (Newman & Thomas, p. 248).

The fourth research question asked: What are the perceptions of architects regarding the involvement of various stakeholders, including students, during the design and programming phases of a school facility project?

The Architect Interview sessions revealed that the architect at all four sites had an integral and collaborative role in selecting which stakeholders would be included in the design and programming process of their facility. As the primary facilitator of stakeholder meetings, the architect at each site was also tasked with gathering and interpreting the input from the various groups and individuals that were asked to

participate in the process. Each of the architects described a pattern of significant teacher involvement, and limited student involvement.

As indicated in Table 47, while receptive to the idea of greater student involvement, the architects in this study seemed unsure of their ability to realize this objective. The findings of this study indicated that although the idea of involving students in the design process is not a new idea, it somehow lacks implementation. Documented standards (Myers & Robertson, 2004; Seattle School District, 2002) suggest or prescribe the involvement of students in the programming and planning of school facilities. The United Kingdom's own government watchdog on architectural matters, the Commission for Architecture and the Built Environment (CABE) has warned that "there is insufficient effort being made to consult the users of school buildings" (as cited in Burke & Grosvenor, 2003). Unfortunately for architects and educators, none of the standards define or outline specific procedures for engaging students in the process. The architect at each site of this study reinforced these concerns. Each one seemed to be looking for a methodology to help them implement greater student involvement. They also expressed a belief that it is incumbent upon school administrators to be more receptive to the idea.

Implications and Recommendations

It is in everyone's best interest to develop a greater understanding of the impact educational facilities have on the academic success of children, and begin to design new facilities with a better understanding of the changing needs of students by involving them directly in the process. The results of this study endeavored to provide school administrators and architects with vital assistance in developing optimal learning environments by providing an awareness of the importance of including students in the

design process. If we expect 21st-century school facilities to have a greater impact on students they serve, these same students must receive adequate representation during the design and planning process of the facility.

Near the completion of this study, Weekes and Williams (2011) published a list entitled “10 of the most innovative strategies for creating 21st century schools where students thrive” (p. 14). The number one item on this list was to engage all stakeholders in the design process. As Weekes and Williams suggested, “The foundation for creating a schoolhouse where students will thrive is the early engagement of everyone with a stake in the success of school. This includes teachers, administrators, community members, nearby community organizations, and, most importantly, students” (p. 14). As the findings of this study suggested, excluding or underutilizing student participation in the development of the academic areas of a school facility may be leaving valuable perceptions out of the process.

There is clearly a need for the development of a methodology to assist architects and educators in realizing greater student involvement in the design and planning process of new facilities. Lee (2006) suggested further research regarding the importance of leadership on the construction of new school facilities. Involving the proper individuals in the design process seems to be critical to the success of the completed project. To achieve the appropriate changes in the design of learning environments, the appropriate input must be obtained. As key individuals in determining who will participate in the design and planning of new school facilities, school principals should be given clearer guidelines regarding the value of student participation. The architects interviewed in this study all indicated the need for district or administrative support in implementing a

greater level of student involvement. Additional research regarding both the benefit of, and the methodology for, including students in the design and planning process would aid architects in their efforts to encourage school administrators to consider student involvement a critical element.

The lack of substantive student involvement in the design and process of many facilities makes it difficult, if not impossible, to predict what impact a greater level of student involvement may have in realizing greater change in the outcome of new facility designs. However, the differences observed between student and teacher perceptions regarding the physical characteristics of the learning spaces at the four recently completed high schools included in this study suggests the value in obtaining more student input during the design and planning process of future facilities. As the funding available for school construction tightens, having a clearer perspective regarding the value, or perhaps more importantly, the insignificance a particular design feature has on the learning environment will help to prioritize construction spending.

While there is a clear need for greater student involvement in the design and planning process of school facilities, there is an equally challenging need to communicate and validate their inclusion with teachers. Newman and Thomas (2008) concluded that even though “schools are not provided with sufficient guidance or methods to enable student participation in the design of new schools” (p. 248), staff and students discovered many positive aspects from the process. Guha, et al. (2005) indicated that “The techniques of Cooperative Inquiry enable children and adults to work together to create innovative technology for children” (p. 40). Guha et al. concluded that intergenerational partnerships can lead to unexpected technology innovations, as well as establishing

methods for working with children (p. 42). Given the differences observed in this study between teacher and student perceptions regarding the physical design characteristics of their learning environment, it seem imperative to also consider applying the pattern of participatory design should also be considered during the design of educational facilities.

This study was conducted at four sites within a specific geographic area, and therefore has limitations. However, given the observed differences between teacher and student perceptions, further study seems worthy of consideration. Two opportunities for further research could include (a) a much larger sample that included a greater number of sites, or (b) applying the methodology of this study to the EQES data collected by OECD to obtain a multi-national perspective on the differences between teacher and student perceptions.

The EQES questionnaire that was utilized for this study only allowed for the statistical comparison of four questions that specifically addressed the learning spaces of the facility. Given the significance of classroom areas to the success of educational communities, further study dedicated to the exploration of teacher and student perceptions regarding the learning spaces across a larger sample could provide additional insight. A questionnaire with specific and detailed questions about the classroom area should be considered for further research. Administering the study across a greater number of sites, and other geographic areas outside the mid-Western states could provide additional insight regarding the differences between teacher and student perceptions.

All of the interview sessions conducted during this study, revealed varying levels of interest on the part of teachers, principals, and architects regarding the involvement of students during the design and planning stages of school facility design. There also

seemed to be no clear pattern regarding the decision of when and how to involve students in the process. A study focused specifically on the successful involvement of students during the design and planning process could help architects and educators by providing specific protocols.

Final Remarks

The findings of this study emphasized continued attention to the body of literature that suggested the need for further research to gain a better understanding of the value of stakeholder input during the design and programming process of school facilities. Change certainly seems unlikely if the process continues to follow the current design and programming practices. As architects and educators learn to work in a more collaborative setting to design new school facilities, a better knowledge of the perceptions of teachers and students seems imperative. Stakeholder involvement must remain the central element of the design and planning efforts. Students must not be the forgotten or overlooked participant. They should be viewed as an integral team member when considering the design and programming of new educational facilities. To overlook or exclude their voice may create a critical void in the shaping of more effective 21st-century school facilities.

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Appendix A

OECD Permission to Use EQES Questionnaire

Dale C. Jerome
School of Graduate and Continuing Studies
Olivet Nazarene University
One University Avenue
Bourbonnais, IL 60914

April 27, 2010

Hannah v. Ahlefeld, Analyst
Centre for Effective Learning Environments (formerly PEB)
OECD Education Management and Infrastructure Division
2, rue André Pascal
F-75775 Paris Cedex 16
FRANCE

Dear Hannah:

Thank you again for agreeing to allow me the use of the Evaluating Quality in Educational Spaces (EQES) survey as part of my dissertation. As I indicated, I will be using a paper only version of the survey, and I have modified it slightly to suit the needs of my research.

I have attached copies of the survey, in the form they will issued, for your review.

Please acknowledge your permission to use the survey by signing and returning a copy of this letter for my records.

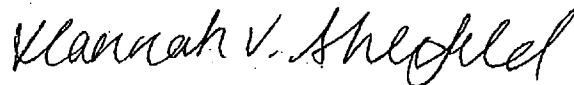
Thank you for your assistance. I greatly appreciate your cooperation in this matter.

Sincerely,



Dale C. Jerome

I hereby authorize the use of the EQES survey questions for use in the dissertation research to be conducted by Dale C. Jerome.



Hannah v. Ahlefeld, Analyst
Centre for Effective Learning Environments

Appendix B

Sample Copy of Superintendent's Permission Letter

(insert date here)

Chair, Institutional Review Board
Office of the Vice President of Academic Affairs
Olivet Nazarene University
One University Avenue
Bourbonnais, IL 60914

Olivet Nazarene University Review Board,

After reviewing the proposed study, *School facility design: Are we asking the right people?*, presented by Mr. Dale Jerome, a doctoral student at Olivet Nazarene University, I have granted permission for the study to be conducted at (insert name of school here).

I understand the study is guided by the following question: What are the perceptions of school administrators, educators (teachers), and students, in a grade nine through twelve high school setting, regarding the physical elements that have an impact on quality in the learning environment? The primary portions of research will include:

1. A randomly selected group of teachers completing questionnaires and participating in a follow-up interview session.
2. Student participation in completing questionnaires.
3. An interview session with the building principal.
4. An interview session with the design architect of the facility.

I understand that the questionnaires will be completed by teachers and students during a regularly established class period. The principal and teacher interview sessions will occur outside the classroom setting shortly after completion of the questionnaire. I understand that all of the research will be completed at our site by (insert date here).

I understand that, if requested, Mr. Jerome will provide me with a copy of all IRB approved documents related to his research. Any data collected by Mr. Jerome will be kept confidential and will be securely stored at the researcher's home.

Sincerely,

(insert name and title here)

Appendix C
Teaching Staff Questionnaire

TEACHING STAFF QUESTIONNAIRE

Basic Information

Please provide the following information about yourself and your school.

Name of School: _____

Current grade level(s) taught (check all that apply): 9 10 11 12

Current subject(s) taught: _____

Years of teaching experience:

5 or less

5 to 10

10 to 20

20 or more

Instructions

This questionnaire requests information about the following aspects of the spaces and places in which you teach, and the school spaces in general:

1. Teaching spaces.
2. Comfort.
3. School's appearance.
4. Safety and security.
5. Maintenance.

- *Teaching staff are requested to complete **ALL** questions. If a question is not applicable, please check "Not applicable".*
- *Please **check** one box for each question.*
- *The questionnaire should take students about **25-30 minutes** to complete.*

Your responses will remain strictly confidential. They will be used in a study about the quality of the school learning environment.

1. TEACHING SPACES

1.1 Please list the space(s) that you currently use for teaching (e.g. regular classrooms, computer laboratory, science laboratory, library, gymnasium or sports spaces).

1.2 How much do you agree or disagree with the following statements about the teaching space(s) you currently use?

a) The spaces are large enough to accommodate the number of students being taught.

Strongly disagree Strongly Agree Not applicable
 1 2 3 4 5

b) Furniture can be easily moved and arranged to accommodate different learning activities (e.g. activities in large or small groups; seating arrangements in circles, rows or groups).

Strongly disagree Strongly Agree Not applicable
1 2 3 4 5

c) There are different areas for students to pursue different learning activities (e.g. quiet space for individual study or reading; space for computer work; space for group work).

Strongly disagree Strongly Agree Not applicable
1 2 3 4 5

d) The physical layout of the classroom allows for new methods and teaching practices.

Strongly disagree Strongly Agree Not applicable
1 2 3 4 5

e) There are areas where students' work can be displayed (e.g. wall boards).

Strongly disagree Strongly Agree Not applicable
1 2 3 4 5

f) There is enough storage space for teaching materials and students' work.

Strongly disagree Strongly Agree Not applicable
1 2 3 4 5

g) There is enough space for me to work at my desk or move around when teaching.

Strongly disagree Strongly Agree Not applicable
1 2 3 4 5

h) Students have adequate access to functioning computers, with Internet.

Strongly disagree Strongly Agree Not applicable
1 2 3 4 5

i) I can use electronic equipment – such as video projector, DVDs and projection screens.

Strongly disagree Strongly Agree Not applicable
1 2 3 4 5

j) The school is accessible for students with special needs.

Strongly disagree Strongly Agree Not applicable
1 2 3 4 5

2. COMFORT

2.1 How much do you agree or disagree with the following statements about the temperature and air quality in the teaching spaces you currently use?

a) My classroom has good air circulation (*i.e.* I can breathe easily, it is not too stuffy or too breezy).

Strongly disagree Strongly Agree Not applicable
 1 2 3 4 5

b) The temperature in my classroom is comfortable in:

Winter.

Strongly disagree Strongly Agree Not applicable
 1 2 3 4 5

Summer.

Strongly disagree Strongly Agree Not applicable
 1 2 3 4 5

c) I can control ventilation and temperature in the classroom (*i.e.* you can open and close windows; switch on fans or heaters; or adjust the thermostat).

Strongly disagree Strongly Agree Not applicable
 1 2 3 4 5

2.2 How much do you agree or disagree with the following statements about the noise in the teaching spaces you currently use?

a) Sound echoes too much in the classroom.

Strongly disagree Strongly Agree Not applicable
 1 2 3 4 5

b) (When students are quiet) I have to raise my voice to ensure that students hear me at the back of the classroom.

Strongly disagree Strongly Agree Not applicable
 1 2 3 4 5

c) Noise from outside the classroom does not disrupt student learning.

Strongly disagree Strongly Agree Not applicable
 1 2 3 4 5

2.3 How much do you agree or disagree with the following statements about the light in the teaching spaces you currently use?

- a) The classroom has good lighting (*i.e.* it is not too light or too bright; there is no glare), so that I can teach and see students and their work without difficulty.

Strongly disagree Strongly Agree Not applicable
1 2 3 4 5

- b) I can control the lighting in the classroom (*i.e.* you can turn the lights on and off, open and close shutters/blinds to control natural light).

Strongly disagree Strongly Agree Not applicable
1 2 3 4 5

3. SCHOOL'S APPEARANCE

3.1 How much do you agree or disagree with the following statements about the visual appearance of your school?

- a) The *outside* of the building is welcoming and attractive.

Strongly disagree Strongly Agree Not applicable
1 2 3 4 5

- b) The *inside* of the building is welcoming and attractive.

Strongly disagree Strongly Agree Not applicable
1 2 3 4 5

- c) The school building conveys to the community the importance of learning.

Strongly disagree Strongly Agree Not applicable
1 2 3 4 5

4. SAFETY AND SECURITY

4.1 How much do you agree or disagree with the following statements about safety and security in your school?

- a) I feel safe in the school.

Strongly disagree Strongly Agree Not applicable
1 2 3 4 5

b) I feel safe in the school grounds.

Strongly disagree Strongly Agree Not applicable
1 2 3 4 5

c) There are secure lockers in which I can store my belongings.

Strongly disagree Strongly Agree Not applicable
1 2 3 4 5

5. MAINTENANCE

5.1 How much do you agree or disagree with the following statements about the maintenance of your school?

a) Classrooms are clean.

Strongly disagree Strongly Agree Not applicable
1 2 3 4 5

b) The school building and grounds generally are clean.

Strongly disagree Strongly Agree Not applicable
1 2 3 4 5

c) Classrooms are in good physical condition (*i.e.* wall paint and floor coverings are not damaged, windows and doors function correctly, and the ceiling does not leak).

Strongly disagree Strongly Agree Not applicable
1 2 3 4 5

d) The school buildings and grounds are well maintained (*i.e.* wall paint and floor coverings are in good condition, windows and doors function correctly, and the ceiling does not leak).

Strongly disagree Strongly Agree Not applicable
1 2 3 4 5

e) The toilet spaces for staff are clean and functional.

Strongly disagree Strongly Agree Not applicable
1 2 3 4 5

6. COMMENTS

If you have any additional comments about your school environment, please write them here. If they refer to one of the questions above, please cite the question number. If your comments relate to a particular room, please indicate the room number or name.

THANK YOU FOR COMPLETING THIS QUESTIONNAIRE!

Appendix D

Teacher Informed Consent Document

INFORMED CONSENT DOCUMENT

Project Title: **School facility design: Are we asking the right people?**

Investigator: **Dale C. Jerome**
Olivet Nazarene University
Department of Graduate and Continuing Studies
e-mail: djerome1@live.olivet.edu
[REDACTED]

You are being asked to participate in a project conducted through Olivet Nazarene University. The University requires that you give your signed agreement to participate in this project.

The investigator will explain to you in detail the purpose of the project, the procedures to be used, and the potential benefits and possible risks of participation. You may ask him/her any questions you have to help you understand the project. A basic explanation of the project is written below. Please read this explanation and discuss with the researcher any questions you may have.

If you then decide to participate in the project, please sign on the last page of this form in the presence of the person who explained the project to you. You should be given a copy of this form to keep.

1. **Nature and Purpose of the Project:** You are being asked to participate in a research study to learn more about the perceptions you hold regarding the quality of the school learning environment. The first stage involves completion of a questionnaire regarding the quality of the school learning environment. The second stage will involve an interview session with all of the teacher participants from your school to gain a better understanding of your knowledge about and impressions of the process used to plan your facility.

2. **Explanation of Procedures:** Your participation in the first stage of the study involves completing the Teaching Staff Questionnaire. As a participant in this study, you will be asked to complete the questionnaire and return it to the principal investigator. The questionnaire should take about 25-30 minutes to complete.

The second stage of the study will consist of answer interview questions in a group setting. I will digitally record the interview and take detailed notes afterward. The interview should take about 35-45 minutes to complete.

3. **Discomfort and Risks:** Opinions and attitudes you express will be conveyed anonymously in the published research. I do not know of any risks to you if you decide to participate in the questionnaire or interview stages of this study. Your responses will be kept confidential, and those published in this study will be kept

anonymous to safeguard your identity. Your participation is voluntary, and you may withdraw at any time. If you withdraw your submitted questionnaire and any recorded comments made by you during the interview will not be noted or used in the published research.

4. **Benefits:** Your participation in the study may aid in our understanding of the design of educational facilities, and the perceptions of teachers regarding the quality of educational spaces.
5. **Confidentiality:** Only the investigator and members of the research team will have access to your questionnaire, and your interview recording and transcript. If information learned from this study is published, you will not be identified by name. Any excerpts from your responses used for illustrative purposes will be kept anonymous.
6. **Refusal/Withdrawal:** Refusal to participate in this study will have no effect on any future services you may be entitled to from the University. Anyone who agrees to participate in this study is free to withdraw from the study at any time with no penalty.

Refusal to participate in this study will have no effect on any future services you may be entitled to from the University. Anyone who agrees to participate in this study is free to withdraw from the study at any time with no penalty.

You understand also that it is not possible to identify all potential risks in an experimental procedure, and you believe that reasonable safeguards have been taken to minimize both the known and potential but unknown risks.

Signature of Participant

Date

Witness

Date

THE DATED APPROVAL ON THIS CONSENT FORM INDICATES THAT
THIS PROJECT HAS BEEN REVIEWED AND APPROVED BY
THE OLIVET NAZARENE UNIVERSITY INSTITUTIONAL REVIEW BOARD

Appendix E

Request for Parent/Student Permission Form

REQUEST FOR PARENT/STUDENT PERMISSION

(insert date here)

Project Title: **School facility design: Are we asking the right people?**

Investigator: **Dale C. Jerome**
Olivet Nazarene University
Department of Graduate and Continuing Studies
e-mail: djerome1@live.olivet.edu
[REDACTED]

Dear Parent/Guardian:

You son or daughter is being asked to participate in a project conducted through Olivet Nazarene University. The University requires that you provide a signed agreement in order for your student to participate in this project.

Informed Consent: I am asking for permission for your son or daughter to complete a questionnaire regarding the quality of the school learning environment. The questionnaire will be administered during a regularly scheduled class period in your student's classroom while the instructor is present. The questionnaire should take about 25-30 minutes to complete.

Confidentiality: Each student's questionnaire will be identified by number only in order to tabulate the responses. Only the investigator and members of the research team will have access to the questionnaire. If information learned from this study is published, your son or daughter will not be identified by name.

Benefits: Your student's participation in the study may aid in our understanding of the design of educational facilities, and the perceptions of students regarding the quality of educational spaces.

Refusal/Withdrawal: Refusal to participate in this study will have no effect on any future services you may be entitled to from the University. Anyone who agrees to participate in this study is free to withdraw from the study at any time with no penalty.

Please discuss this with your child and check the appropriate line on this form. Please also sign and date the back of the form. Thank you for your consideration of this matter.

Sincerely,

Dale C. Jerome

REQUEST FOR PARENT/STUDENT PERMISSION

_____ My child and I give permission for his/her data to be used in this research project and for my child to complete a questionnaire regarding the quality of educational spaces. My child and I understand that their data will remain confidential.

_____ My child and I prefer not to give permission for his/her data to be used in this research project nor for my child to complete a questionnaire regarding the quality of educational spaces. My child and I understand that he/she will not be penalized in any way because of this choice.

Parent Signature

Date

Student Signature

Date

THE DATED APPROVAL ON THIS CONSENT FORM INDICATES THAT
THIS PROJECT HAS BEEN REVIEWED AND APPROVED BY
THE OLIVET NAZARENE UNIVERSITY INSTITUTIONAL REVIEW BOARD

Appendix F
Student Questionnaire

STUDENT QUESTIONNAIRE

Basic Information

Please provide the following information about yourself and your school.

Current Grade Level: 9 10 11 12

Name of School: _____

Classroom Number: _____

Subject taught in Classroom: _____

Instructions

This questionnaire requests information about the following aspects of **your classroom** and **school** in general:

1. Accessibility.
2. Learning spaces.
3. Comfort.
4. School's appearance.
5. Safety and security.
6. Maintenance.

- Students are requested to complete **ALL** questions. If a question is not applicable, please check "Not applicable".
- Please **check** one box for each question.
- The questionnaire should take students about **25-30 minutes** to complete.

Your responses will remain strictly confidential. They will be used in a study about the quality of the school learning environment.

1. ACCESSIBILITY

1.1 How much do you agree or disagree with the following statements about entering and moving around the school?

- a) It is easy to get **to** the main entrance **from** the street (*i.e.* through accessible walkways).

Strongly disagree Strongly Agree Not applicable
1 2 3 4 5

- b) It is easy to get **from** the inside **to** the outside of the building.

Strongly disagree Strongly Agree Not applicable
1 2 3 4 5

c) It is easy to get from one floor within the building to another.

Strongly disagree Strongly Agree Not applicable
1 2 3 4 5

d) It is easy to move along the same floor (*i.e.* there are no congested corridors or changes in the levels in the building which make moving around difficult).

Strongly disagree Strongly Agree Not applicable
1 2 3 4 5

e) The routes or pathways around the **inside** of the building are well signposted or easy to identify for visitors or newcomers.

Strongly disagree Strongly Agree Not applicable
1 2 3 4 5

f) The routes or pathways **outside** the building are well signposted or easy to identify for visitors or newcomers.

Strongly disagree Strongly Agree Not applicable
1 2 3 4 5

g) The **main entrance** is well signposted or easy to identify for visitors or newcomers.

Strongly disagree Strongly Agree Not applicable
1 2 3 4 5

h) There is sufficient room to drop off and pick up students, and for others to drive through.

Strongly disagree Strongly Agree Not applicable
1 2 3 4 5

2. LEARNING SPACES

2.1 How much do you agree or disagree with the following statements about your classroom?

a) There is plenty of space for me to work at my desk.

Strongly disagree Strongly Agree Not applicable
1 2 3 4 5

b) There is plenty of space for me to move around in the classroom and work with others during class.

Strongly disagree Strongly Agree Not applicable
1 2 3 4 5

c) I have access to functioning computers with Internet access in my classroom.

Strongly disagree Strongly Agree Not applicable
1 2 3 4 5

3. COMFORT

3.1 How much do you agree or disagree with the following statements about the temperature and air quality in your classroom?

- a) My classroom has good air circulation (*i.e.* I can breathe easily, it is not too stuffy or too breezy).

Strongly disagree Strongly Agree Not applicable
1 2 3 4 5

- b) The temperature in my classroom is comfortable in:

Winter.

Strongly disagree Strongly Agree Not applicable
1 2 3 4 5

Summer.

Strongly disagree Strongly Agree Not applicable
1 2 3 4 5

3.2 How much do you agree or disagree with the following statements about the noise in your classroom?

- a) There is not too much noise coming from *inside* the classroom to disrupt my work.

Strongly disagree Strongly Agree Not applicable
1 2 3 4 5

- b) There is not too much noise coming from *outside* the classroom to disrupt my work.

Strongly disagree Strongly Agree Not applicable
1 2 3 4 5

3.3 How much do you agree or disagree with the following statements about the light in your classroom?

- a) There is natural light from the windows.

Strongly disagree Strongly Agree Not applicable
1 2 3 4 5

- b) My classroom has good lighting (*i.e.* it is not too dark or too bright), so that I can work comfortably.

Strongly disagree Strongly Agree Not applicable
1 2 3 4 5

3.4 How much do you agree or disagree with the following statements about the furniture in your classroom?

a) I can sit at the desks comfortably.

Strongly disagree Strongly Agree Not applicable
1 2 3 4 5

b) The chairs are comfortable to sit on.

Strongly disagree Strongly Agree Not applicable
1 2 3 4 5

4. SCHOOL'S APPEARANCE

4.1 How much do you agree or disagree with the following statements about the visual appearance of your school?

a) The *outside* of the building is welcoming and attractive.

Strongly disagree Strongly Agree Not applicable
1 2 3 4 5

b) The *inside* of the building is welcoming and attractive.

Strongly disagree Strongly Agree Not applicable
1 2 3 4 5

c) The *classroom* is covered in displays of student's work and other decorations, which makes it look attractive.

Strongly disagree Strongly Agree Not applicable
1 2 3 4 5

5. SAFETY AND SECURITY

5.1 How much do you agree or disagree with the following statements about safety and security in your school?

a) I feel safe in the school.

Strongly disagree Strongly Agree Not applicable
1 2 3 4 5

b) I feel safe in the school grounds.

Strongly disagree Strongly Agree Not applicable
1 2 3 4 5

c) There are secure lockers in which I can store my belongings.

Strongly disagree Strongly Agree Not applicable
1 2 3 4 5

6. MAINTENANCE

6.1 How much do you agree or disagree with the following statements about the maintenance of your school?

a) My classroom is clean.

Strongly disagree Strongly Agree Not applicable
1 2 3 4 5

b) The school building and grounds are generally kept clean.

Strongly disagree Strongly Agree Not applicable
1 2 3 4 5

c) My classroom is in good physical condition (*i.e.* wall paint and floor coverings are not damaged, windows and doors function correctly, and the ceiling does not leak).

Strongly disagree Strongly Agree Not applicable
1 2 3 4 5

d) The school buildings and grounds are well maintained (*i.e.* wall paint and floor coverings are in good condition, windows and doors function correctly, and the ceiling does not leak).

Strongly disagree Strongly Agree Not applicable
1 2 3 4 5

e) The toilet spaces are clean and functional.

Strongly disagree Strongly Agree
1 2 3 4 5

Not applicable

7. COMMENTS

If you have any additional comments about your school environment, please write them here. If they refer to one of the questions above, please cite the question number. If your comments relate to a particular room, please indicate the room number or name.

THANK YOU FOR COMPLETING THIS QUESTIONNAIRE!

Appendix G

Teaching Staff Interview Script

TEACHING STAFF INTERVIEW

Basic Information

The teaching staff interview will be conducted in a group setting using a random subset of the teachers who previously completed the Teaching Staff Questionnaire.

The session will utilize a digital voice recorder to assist in documenting responses to the interview questions.

1. INTRODUCTION

- 1.1 Thank you for participating in this interview session. As a follow up to the Teaching Staff Questionnaire you have already completed, I am seeking to gain further insight into the planning process that took place prior to the construction of your new facility. I am interested in gaining a better understanding of the role each of you played in the design process.
- 1.2 The purpose of this research project is to better understand the process used to design your facility. The goal is also to contribute to the improvement or enhancement of future design opportunities.
- 1.3 Your responses will remain strictly confidential, and they will be only be used for the purposes of this study.

2. PROCESS

- 2.1 What involvement, if any, did each of you have in the planning process for your school?
- 2.2 Do you recall how individuals were selected to participate in the process?
- 2.3 Did you feel the process gave you an adequate voice in the design of the facility?

2.4 What changes might you suggest to improve the involvement of teachers in the process?

3. STUDENT INVOLVEMENT

3.1 Do you recall what efforts, if any, were made to include students in the design process of the new facility?

3.2 Did you feel the process gave students an adequate voice in the design of the facility?

3.3 Do you believe student input had an impact on the outcome of the design?

3.4 Do you believe that students were under-represented in the design of the facility? If so, why do you believe this occurred?

3.5 Do you think that student perceptions are valid? If so, should they play a greater role in the design of school facilities?

4. CONCLUSIONS

4.1 What was your overall impression of the process used to design the new facility?

4.2 What changes, if any, would you make to improve the design process of future schools?

5. CLOSING COMMENTS

5.1 Once again, I want to assure you that your comments will be kept in strict confidence.

5.2 Thank you for your time and interest in providing valuable insight. Your contributions to this research project are greatly appreciated.

Appendix H

Principal Informed Consent Document

INFORMED CONSENT DOCUMENT

Project Title: **School facility design: Are we asking the right people?**

Investigator: **Dale C. Jerome**
Olivet Nazarene University
Department of Graduate and Continuing Studies
e-mail: djerome1@live.olivet.edu
[REDACTED]

You are being asked to participate in a project conducted through Olivet Nazarene University. The University requires that you give your signed agreement to participate in this project.

The investigator will explain to you in detail the purpose of the project, the procedures to be used, and the potential benefits and possible risks of participation. You may ask him/her any questions you have to help you understand the project. A basic explanation of the project is written below. Please read this explanation and discuss with the researcher any questions you may have.

If you then decide to participate in the project, please sign on the last page of this form in the presence of the person who explained the project to you. You should be given a copy of this form to keep.

1. **Nature and Purpose of the Project:** You are being asked to participate in a research study to gain a better understanding of your knowledge about, and impressions of the process used to plan your facility.
2. **Explanation of Procedures:** Your participation in the study will consist of answer interview questions in a one-on-one setting with the researcher. I will digitally record the interview and take detailed notes afterward. The interview should take about 35-45 minutes to complete.
3. **Discomfort and Risks:** Opinions and attitudes you express will be conveyed anonymously in the published research. I do not know of any risks to you if you decide to participate in the questionnaire or interview stages of this study. Your responses will be kept confidential, and those published in this study will be kept anonymous to safeguard your identity. Your participation is voluntary, and you may withdraw at any time. If you withdraw your interview recording will be destroyed.
4. **Benefits:** Your participation in the study may aid in our understanding of the design of educational facilities, the potential for involvement of students in the process, and the perceptions of teachers and students regarding the quality of educational spaces.

5. **Confidentiality:** Only the investigator and members of the research team will have access to your interview recording and transcript. If information learned from this study is published, you will not be identified by name. Any excerpts from your responses used for illustrative purposes will be kept anonymous.
6. **Refusal/Withdrawal:** Refusal to participate in this study will have no effect on any future services you may be entitled to from the University. Anyone who agrees to participate in this study is free to withdraw from the study at any time with no penalty.

Refusal to participate in this study will have no effect on any future services you may be entitled to from the University. Anyone who agrees to participate in this study is free to withdraw from the study at any time with no penalty.

You understand also that it is not possible to identify all potential risks in an experimental procedure, and you believe that reasonable safeguards have been taken to minimize both the known and potential but unknown risks.

Signature of Participant

Date

Witness

Date

THE DATED APPROVAL ON THIS CONSENT FORM INDICATES THAT
THIS PROJECT HAS BEEN REVIEWED AND APPROVED BY
THE OLIVET NAZARENE UNIVERSITY INSTITUTIONAL REVIEW BOARD

Appendix I
Principal Interview Script

PRINCIPAL INTERVIEW

Basic Information

The principal interview will be conducted individually with the current principal of each facility.

The session will utilize a digital voice recorder to assist in documenting responses to the interview questions.

1. INTRODUCTION

- 1.1 Thank you for participating in this interview session. I am seeking to gain insight into the planning process that took place prior to the construction of your new facility. I am also interested in gaining a better understanding of the role you played in the design process.
- 1.2 The purpose of this research project is to better understand the process used to design your facility. The goal is also to contribute to the improvement or enhancement of future design opportunities.
- 1.3 Your responses will remain strictly confidential, and they will be only be used for the purposes of this study.

2. PROCESS

- 2.1 What involvement, if any, did you have in the planning process for your school?
- 2.2 Do you recall how individuals were selected to participate in the process?
- 2.3 Did you feel the process gave you an adequate voice in the design of the facility?
- 2.4 What changes might you suggest to improve the involvement of principals in the process?

3. STUDENT INVOLVEMENT

- 3.1 Do you recall what efforts, if any, were made to include students in the design process of the new facility?
- 3.2 Did you feel the process gave students an adequate voice in the design of the facility?
- 3.3 Do you believe student input had an impact on the outcome of the design?
- 3.4 Do you believe that students were under-represented in the design of the facility?
If so, why do you believe this occurred?
- 3.5 Do you think that student perceptions are valid? If so, should they play a greater role in the design of school facilities?

4. CONCLUSIONS

- 4.1 What was your overall impression of the process used to design the new facility?
- 4.2 What changes, if any, would you make to improve the design process of future schools?

5. CLOSING COMMENTS

- 5.1 Once again, I want to assure you that your comments will be kept in strict confidence.
- 5.2 Thank you for your time and interest in providing valuable insight. Your contributions to this research project are greatly appreciated.

Appendix J

Architect Informed Consent Document

INFORMED CONSENT DOCUMENT

Project Title: **School facility design: Are we asking the right people?**

Investigator: **Dale C. Jerome**
Olivet Nazarene University
Department of Graduate and Continuing Studies
e-mail: djerome1@live.olivet.edu
[REDACTED]

You are being asked to participate in a project conducted through Olivet Nazarene University. The University requires that you give your signed agreement to participate in this project.

The investigator will explain to you in detail the purpose of the project, the procedures to be used, and the potential benefits and possible risks of participation. You may ask him/her any questions you have to help you understand the project. A basic explanation of the project is written below. Please read this explanation and discuss with the researcher any questions you may have.

If you then decide to participate in the project, please sign on the last page of this form in the presence of the person who explained the project to you. You should be given a copy of this form to keep.

1. **Nature and Purpose of the Project:** You are being asked to participate in a research study to gain a better understanding of your knowledge about, and impressions of the process used to plan a particular high school facility.
2. **Explanation of Procedures:** Your participation in the study will consist of answer interview questions in a one-on-one setting with the researcher. I will digitally record the interview and take detailed notes afterward. The interview should take about 35-45 minutes to complete.
3. **Discomfort and Risks:** Opinions and attitudes you express will be conveyed anonymously in the published research. I do not know of any risks to you if you decide to participate in the questionnaire or interview stages of this study. Your responses will be kept confidential, and those published in this study will be kept anonymous to safeguard your identity. Your participation is voluntary, and you may withdraw at any time. If you withdraw your interview recording will be destroyed.
4. **Benefits:** Your participation in the study may aid in our understanding of the design of educational facilities, the potential for involvement of students in the process, and the perceptions of teachers and students regarding the quality of educational spaces.

5. **Confidentiality:** Only the investigator and members of the research team will have access to your interview recording and transcript. If information learned from this study is published, you will not be identified by name. Any excerpts from your responses used for illustrative purposes will be kept anonymous.
6. **Refusal/Withdrawal:** Refusal to participate in this study will have no effect on any future services you may be entitled to from the University. Anyone who agrees to participate in this study is free to withdraw from the study at any time with no penalty.

Refusal to participate in this study will have no effect on any future services you may be entitled to from the University. Anyone who agrees to participate in this study is free to withdraw from the study at any time with no penalty.

You understand also that it is not possible to identify all potential risks in an experimental procedure, and you believe that reasonable safeguards have been taken to minimize both the known and potential but unknown risks.

Signature of Participant

Date

Witness

Date

THE DATED APPROVAL ON THIS CONSENT FORM INDICATES THAT
THIS PROJECT HAS BEEN REVIEWED AND APPROVED BY
THE OLIVET NAZARENE UNIVERSITY INSTITUTIONAL REVIEW BOARD

Appendix K
Architect Interview Script

ARCHITECT INTERVIEW

Basic Information

The architect interview will be conducted individually with the architect responsible for the design of each facility.

The session will utilize a digital voice recorder to assist in documenting responses to the interview questions.

1. INTRODUCTION

- 1.1 Thank you for participating in this interview session. I am seeking to gain insight into the planning process that took place prior to the construction of this facility. I am also interested in gaining a better understanding of the role you played in the design process.
- 1.2 The purpose of this research project is to better understand the process used to design the facility. The goal is also to contribute to the improvement or enhancement of future design opportunities.
- 1.3 Your responses will remain strictly confidential, and they will be only be used for the purposes of this study.

2. PROCESS

- 2.1 Describe your role in the planning process of this facility.
- 2.2 Please indicate who participated in the design process.
- 2.3 How were individuals selected to participate in the process?
- 2.4 Did you feel the process gave everyone an adequate voice in the design of the facility?

2.5 What changes might you suggest to improve the involvement of others in the process on future school facilities?

3. STUDENT INVOLVEMENT

3.1 Do you recall what efforts, if any, were made to include students in the design process of the new facility?

3.2 Did you feel the process gave students an adequate voice in the design of the facility?

3.3 Do you believe student input had an impact on the outcome of the design?

3.4 Do you believe that students were under-represented in the design of the facility? If so, why do you believe this occurred?

3.5 Do you think that student perceptions are valid? If so, should they play a greater role in the design of school facilities?

4. CONCLUSIONS

4.1 What was your overall assessment of the process used to design this facility?

4.2 What changes, if any, would you make to improve the design process for future schools?

5. CLOSING COMMENTS

5.1 Once again, I want to assure you that your comments will be kept in strict confidence.

5.2 Thank you for your time and interest in providing valuable insight. Your contributions to this research project are greatly appreciated.

Appendix L

Transcripts of Teacher Interview Sessions

TRANSCRIPT OF SITE 1 TEACHING STAFF INTERVIEW

This is the transcript from the teaching staff interview at Site 1. The interview was held on November 2, 2010. The outline titles and numbering of this transcript follow the sequence utilized in the Teaching Staff Interview Script found in Appendix G.

2. PROCESS

2.1 What involvement, if any, did each of you have in the planning process for your school?

Teacher #1 – I was on a leave during that time, so I did not have any involvement.

Teacher #2 – I had none.

Teacher #3 – I was involved. It happened to be at the end of my first or second year of teaching. So (principal's name) and I came in at the same time. I was invited to go on a tour of three buildings. We went and visited a school in (state name), we also visited (name of school) which was recently completed, and (name of school) which was going to be completed for the fall. So, I was involved in that. I got to visit all three and provide feedback, what I thought about the schools, what I liked and disliked.

Teacher #4 – I was hired a year after the building was completed, so I had none.

Teacher #5 – I had very minimal, I spent one year at the old building, but I was a long term substitute. So I was just looking for the job versus... The one thing I can tell you I remember, I was involved in the moving from one building to the next. I was involved in dialogue that teachers had in the lunch room, and passing time when they were trying to pick rooms, what teacher was going to be in what room. That was

interesting, because the science teachers who wanted to be by their friends couldn't be because they were put in a lab. So there was that dialogue. I remember that we took tours of the new building. And again, I didn't really have any input, I just wanted the job versus I want to be in this room, or I want to be in that room. I will tell you that, and this is a case that came in sort of during the middle of this, we originally were told that there was going to be a freshman campus, which would be all the freshman kids, lockers, students, teachers were all going to be on one floor. And that became a problem when all of the science was upstairs, and the computer lab was upstairs. So we had to actually two onto the top floor and two onto the bottom floor for the freshman campus, so that became an architectural problem.

2.2 Do you recall how individuals were selected to participate in the process?

Teacher #3 – From my vantage point, I think they took people from each of the major content areas. So, for instance I got to go, I think mostly because I'm in technology, and secondly because I was new to the district. Kind of looking at it as, I don't know any better, you know, how our current building worked or whatever, and what we would out of a newer technology based building.

Teacher # 5 – No, they were finishing the design of the building when I came, so it was already picked and chosen.

Teacher #4 – I can tell you that in the smaller rooms that I have, the science rooms, they moved the wall back to accommodate another row of desks, because I guess they designed the lab, the lab itself is huge, but the lecture room is super small. It was half the size of a normal classroom. So it was even smaller yet, and they moved the wall

back into the lab area to create another row, so you could actually fit 33 desks in there. Before you could only fit 27.

Teacher #5 – and I don't really remember how they did that, other than I thought they just took out counter space.

Teacher #4 – I think that may have been what they did.

Teacher #5 – I don't think they actually moved the wall. I think there was a counter there?

Teacher #4 – Someone told me they moved the wall.

Teacher #5 – Again, that was before both of us were here.

2.3 Did you feel the process gave you an adequate voice in the design of the facility?

Teacher #3 – Absolutely, I think being asked to participate in something like that allowed me to voice my own opinions, about what I liked and what I didn't like. And also question why things were done a certain way in the three schools we got a chance to see.

2.4 What changes might you suggest to improve the involvement of teachers in the process?

Teacher #2 – It's difficult for me to say. I believe they were already in the planning stages when I started working here in September of 2004, but I was in the counseling office before, working as a secretary before I became a teacher, and I believe they were just breaking ground, so before they even broke ground the design was in place, so I don't even know what was done.

Teacher #1 – I wasn't involved in the design of this facility either, but I do remember some of the activity that took place when I was in high school and they were designing a new building for our district. I just remember that our teachers would be

gone, maybe once every two weeks. There was a group of about ten teachers who were bussed all around the state to look at other schools. They would also constantly have meetings after school about what needs to be included, and what doesn't need to be included in that school. Obviously it's the biggest new high school in the state, but it doesn't have everything that this school has actually.

3. STUDENT INVOLVEMENT

3.1 Do you recall what efforts, if any, were made to include students in the design process of the new facility?

Teacher #3 – I don't really recall many students being involved at all. I know we do a really good job at school in involving students in terms of, you know we have our student council president attend board meetings and so forth, but as far as involving students in the actual *design* of the school, I don't know that we did a lot of that, if any? If I'm not mistaken, I think we had a chance to *ask* students when we went on the tour, what they liked about the design of the three buildings that we saw. But actually involving our students in that tour, or actually looking at those schools, I don't think we included those.

Teacher #5 – The only student involvement that I'm aware of would be student driven tours through the building. When we first came over here, we had a grand opening, that kind of thing. Students were trained if you will, and they guided tours of adults. I don't know that students had a decision making effort? I don't remember because that would have been a couple of years before us.

3.2 Did you feel the process gave students an adequate voice in the design of the facility?

Teacher #3 – No, not at all. I think if we were to go back and do it again... if you could go back five or six years ago, when we were looking at the design of the school and what we wanted, both from what the board of education wanted as far as the new building, and the principal and superintendent and so forth, I think we should have included students. But at the same time, I think it's such a... and you have to really look forward, look forward in terms of time to say yes, we can see how this is going to work, and with many students, once they leave school they don't come back. So I'm just wondering if it would have been advantageous to have had some students there, and say yes we like this or no we don't like this, or are they just going to see the exterior, the colors, the size? The things in the room as opposed to the actual design of the building?

Teacher #1 – Maybe it would have been advantageous to ask them, especially looking at the old school, what are some... you know, maybe classroom sizes? Are there certain classrooms where they feel more comfortable than others, why would that be? Or where do students tend to congregate? You know, in some schools they have foyers where that tends to be the senior area. We tend to have around our stairs where certain clientele, for lack of a better word, tend to hang out in our school. You know, if there's certain areas of congregating students, ask them where do they see... you know, we really don't have areas where I see it being the senior area, where a lot of schools have, and that tends to be down the halls... I don't know.

3.3 Do you believe student input had an impact on the outcome of the design?

Teacher #3 – I don't think student voices were necessarily considered in designing the building. I think after the fact, once they see the finished product, they're more easily to say why was this done, or why wasn't this done?

Teacher #2 – Some of the teachers have said that too, and the administration.

3.4 Do you believe that students were under-represented in the design of the facility?

If so, why do you believe this occurred?

Teacher #3 – I don't think it was intentional to leave students out of the planning stage. I just think it is hard for a majority of students to be able to say, you know, we need to be able to design a school that looks like this, and to be able to actually say this is the function that it's going to serve, this is why we're going to do it this way, this is the advantage of doing it this way, as opposed to saying we want high ceilings, we want big open spaces, we want neat colors.

Teacher #1 – (Teacher #3's name) has been here longer than anybody, but want I kind of foresee, I was just moving to this school a couple of years... I actually made the phone calls to get the bond passed and that was just done as somebody who enjoyed small schools, who came from a family of educators, and I just had my daughter, so I felt it was important to pass a bond. So the bond was passed, and I remember the excitement of the whole community, and you probably living in this community... The whole community was so excited when this bond passed. You could just feel the buzz, and I almost think that was part of it, that people were so excited, and got so carried away with the design, that it was almost like you didn't step back and say okay, who are we going to get involved in the design? I think people almost couldn't wait to get their hands on some designs and get going. And you had some people who really pushed this whole effort and I'm not saying they were greedy or anything like that, but I just think there was so much energy into it that they just couldn't wait to get things on paper. And it was thought out, but I don't think that the thought was there to say let's take a step back and start talking

to kids. It was a pretty small school and the thinking... I think maybe when you have a larger school with a bigger student base you would think more about the student population? I'm guessing. That would be my thinking, that it would be easy to overlook the students with all the energy and the buzz, and can't wait to get going on it. Kind of a small student base that wasn't real vocal, and they knew that the kids would just be excited with... just coming into this school, anything the kids got they were going to be ecstatic.

Teacher #2 – Well there were a number of community meetings too, and I'm trying to remember...

Teacher #1 – You are right, there were quite a few community meetings.

Teacher #2 – yeah, I remember going to community meetings that were led... I think that's the first time our new Superintendent was there. So they did pull the community together quite a bit. At least on two occasions that I remember being at where they did talk about what should be included.

Teacher #1 – And I think that was why so much, why the bond passed, because they brought the community in. And I think that was the reason why we have the pool, and why we have the track above. So the community had more say that the students I would say. (Which the students are community, but?)

3.5 Do you think that student perceptions are valid? If so, should they play a greater role in the design of school facilities?

Teacher #2 – I don't know if they have the maturity level for the actual design, but I do believe they at least have... like what type of things would you like to see? What

type of things would you like to see improved in the design of your classroom? Or what would make school more comfortable for you, or what would make... I don't know.

Teacher #3 – I think that they would have ideas about what it would look like when you have the four walls and the ceiling in there, but the actual school itself, I think they could say if I were to go to School XYZ, I like that fact that they have bright lights all over the place. If they went to a different school, they like the fact that they have furniture in the classroom that looks comfortable and looks new, and looks nice. But if you were actually to ask students to look at blueprints, maybe the ones that are interested in architecture or design and things like that, would kind of naturally say this looks kind of cool, but what kind of attention span do they have for it? Do they have more than ten or fifteen minutes looking at it and say okay, now I'm bored and I want to go do something else? Or are they going to say this is really exciting and I have the chance to be involved in something that's going to be around for 50, 60, or 70 years, and say that I was a part of that. I think that's what it comes down to. You know kids today have all these technology tools at their fingertips, and their attention span seems to be so short, and I'm not necessarily saying we should exclude them from an opportunity like this. But at the same time, if they go on a trip... We basically left at seven or eight in the morning and we got back at four or five o'clock, so we literally spent all day. That's an all day trip, and I don't know how many high school students would give up a whole day just to look at three buildings.

Teacher #2 – not only that, but I don't want this to come off as mean in any way, because there are some kids who are very caring and want to do things that benefit the future, but there are some student who say well I don't get to enjoy it, so why would I

want to spend all this time working on it. So those with younger siblings might be all about it, but others who are like I'm out of here in another year and I just can't wait to get out of here. There's no, oh maybe I might end up in this community 20 years from now and have a family that would be attending this school. That whole thought process, for a portion of students it's there, but not for the entire population.

Teacher #3 –Just to piggy-back off of that, you know (Teacher #2) is second generation (school name) High School teacher for that matter, let alone resident. Mom was a teacher in the building, she's a teacher, her kids are now in the schools here, so she's invested in this community. And we could say the same, all of could go down the list and we could say, especially those of us who have been here five or ten years, we can see siblings, and then we hear stories from students and they say my mom or dad went here, my grandparents went here, so it's definitely a community where if a student has siblings, or is one of those community members that generations have gone through, then yes they should be involved in what's going on, because they have a vested interest.

Teacher #1 – and I think it's kind of like any time you make a technological change in a business. They say you need to get all users and everybody involved so they can accept the change. You get students involved, maybe they respect the building a little bit more because they had a little bit of a say in the change. The bad thing about that is, you obviously can't ask 9th graders what they want in a building because it's not going to be built before they go. So that's the tough thing. You almost need to ask 6th graders because they're going to be the ones that are going to be in the building. So I think that's the difficult thing is that the students that you're going to be asking to give input, they're really giving input base upon what kids six years, did it take six years to build the

building?... six or five years down the road, what they're going to want and think in their rooms, not that group, so that's tough.

Teacher #5 – I think so. I think students have great input. They know... Right now they're dealing with the cafeteria size. There's not enough room to sit in the cafeteria. So I think they would have had a valid argument to make the cafeteria bigger. Our theater and cafeteria are connected. To take some of that space or whatever. I think, well I don't know... I think students had, they must have had input, because now that you're saying this there are things that I remember students mentioning. Our lockers are bigger in the new building. I remember hearing that the P.E. teacher had students help him design the weight room. Setting up where things go in the weight room. I remember things like that.

4. CONCLUSIONS

4.1 What was your overall impression of the process used to design the new facility?

Teacher #3 – First of all, I was happy to be asked to be involved with it. Being a brand new person in the district and being asked to be involved in the process that I knew was going to be kind of a big deal, was nice. The actual process of going through and looking at the different schools, and having administrators in those buildings point out this is the design of the building and giving us a tour, and talking about their process in terms of why things were designed a certain way, and allowing us the opportunity to not only do that, but to also ask questions was really great. And if you were to of course look at the three schools we visited, having walked through this building, you'd be able to pick out the parts of the building we modeled our building after. One school it was the gym,

another it was the main-street, and another, the physical t-shape of the building. Once the bond issue passed and to be involved was really nice.

Teacher # 5 – I don't think I've heard too much about the process. And it goes the way it always goes. The one person who you're going to hear from is always unhappy. I don't want to be in a small room, that person is always going to be the most vocal, but I don't know that she had much say in the process?

Teacher #4 – from my understanding, it was all the higher-ups, between the principal, superintendent, builders, and designers.

Teacher #5 – Even in terms of ordering the furniture, because I think I came around when they were ordering the furniture. I remember teachers talking about wanting tables versus desks, and yet when we got here, they were all desks.

4.2 What changes, if any, would you make to improve the design process of future schools?

Teacher #3 – Obviously involve students would have been number one. The actual process that I was involved in, we looked at three schools, and there may have been other schools that I wasn't able to visit, there may be other and I can't say that... If they didn't visit other schools, that would be one thing. I guess since we did it during the summer there weren't many students around, so to actually visit the schools when they were in session would have been something that I thought would have been very helpful. So not only get a chance to ask students while they're in the environment, whether it was a class, or you pull a couple of kids out of the class to talk to visitors, but to actually see the students interact in the environment I think would have been helpful. The administrators were there to give us a tour, and there might have been one or two students

there for whatever reason, the administrator may have asked them to come in and be a part of our visit, I'm not sure if that's true since it was ten years ago, but actually visiting the school while it was in session, all this took place in July, and actually see the school running, see students changing classes, I think would have been really helpful to us.

Teacher #1 – For having such a big school, there just seems to be a lack of thought in some things. Our science labs are miniscule like the classrooms. People are on top of each other. For having such a big and beautiful school, people are practically sitting on top of each other, it's horrible. Another thing, this classroom for instance, they have the weight room above my room. To this day I don't get it. You have two sets of locker rooms that way and I don't get why they would put a multi-purpose room that's never used during the day over locker rooms, and the weight room over a classroom. I have all these pipings back there that make all kinds of noises and it looks like an institution in here. So it's just... I love that my room is big, but they just didn't think about the noise above and just the learning environment, sometimes it's not very conducive. I don't even know what went wrong with some of the classroom sizes. I don't know if they just kind of looked at the size of the floor and they forgot the walls go on top of that, or what happened there?

Teacher #3 – I think it was because so many sets of eyes look over a blueprint, and you didn't catch this so now to go back and do this, it's going to cost you "x" amount of dollars. I may be off on that, but that's my general feeling. If you're going to make changes know it's going to cost you a lot of money.

Teacher #1 – but for the most part we get a lot of complements on our school. I'm very proud of it.

Teacher #3 – given the size of our community, to have a school like this, given the economic conditions, I think was pretty impressive. Secondly, as she said we get complements left and right. People say, you're lucky to be here, my college wasn't this nice. The fact is, there I some things we could change, but for the most part, I don't have any complaints whatsoever.

Teacher # 4 – I'm sure there was an overall goal, but at the same time, I'm sure the teachers were surveyed?

Teacher #5 – I think the teachers were surveyed, and I think the students were? I know the community had a big part in it, because I know that's why the pool is here. The community wanted the pool.

Teacher #4 – It's my impression that the principal got input from everyone, all the teachers, but then he just ended up doing what he thought best.

TRANSCRIPT OF SITE 2 TEACHING STAFF INTERVIEW

This is the transcript from the teaching staff interview at Site 2. The interview was held on March 15, 2011. The outline titles and numbering of this transcript follow the sequence utilized in the Teaching Staff Interview Script found in Appendix G.

2. PROCESS

2.1 What involvement, if any, did each of you have in the planning process for your school?

Teacher #1 – I had none.

Teacher #2 – Interestingly, I was involved in the prior high school in 1990, and at that time, I had designed my own room, in science, and that ended up being a template for the other science rooms. That was my sole involvement in that building, but in this building as the science department chair, I was involved in coordinating all my science teachers, and what their desires were. We were asked what our requirements were, and there was a lot of interaction between the architects and us as a science department to take a look at the requirements. And, instead of us each designing our own room, we put in the requirements, they came up with the initial plans and then said, how does this look? Does this meet your requirements? And in actuality, in the room size they did a fantastic job. They gave us a lot more room than we had had in our other... So, for example, in the other building our room size was around 1,150 square feet, and we're closer to 1,800 square feet in our class sizes. Which for a lab setting, because we typically have a setting where you have a lecture area and a lab area, you take all 30 some odd kids, we have as

many as 35 this year, and put them into either area, you're only really working in 900 square feet for each situation. So, we had a lot of input there. The input for the classrooms themselves was very good, all the way down to the layout of the cabinetry, the makers of the cabinetry. They listened to our input, and I can say that from a physics teacher standpoint. They wanted more of an open classroom with movable tables, and the biology teachers wanted set tables, lab stations that were not going to move. They listened to all of that and they fulfilled the requirements phenomenally. We wanted room darkening shades, because especially for physics it's important to have absolute darkness in there. They listened to that, and they provided that. There was a lot of interaction in terms of the equipment that was going to be purchased through bond supply for the science classrooms. So there was a lot of interaction, there were good strengths there. I was also involved in all of the bond meetings that I mentioned to you earlier, as well as the schematic design, so not just creating the design, but also helping raise the funds and what we were telling the public. I ended up, because my son was on the swim team, and because I knew the swim coach real well, I was asked to coordinate and head the sub-committee on the design of the pool: bring elements of the community together, that what they needed. In terms of Sea Lions, the younger kids, and through community ed, the teams at the high school, as well as the fact that my wife is a phys-ed teacher here, and what her requirements might be. So I headed up that committee, to bring together the people that would have the information necessary of what they saw as the vision for a pool. To bring that element together, and that process was also a very positive experience, in terms of meeting the requirements within the parameters that that group had determined.

There was intent on the design of this building to have it be, have academic pathways. It started off as career pathways, but then it quickly shifted over to academic pathways to be in line with the State's intent to have students see that their academic pathways could be more career-based, that could be pointing toward maybe something in the health care related field. So, we had health and human services pathway. We have a business and computers pathway. We have an arts and technology pathway. Each pathway was going to have as its center-piece one of the electives, and we had an opportunity to decide, to some degree, what we thought those pathways should be like. As that took place, determining which classroom would go where, into which pathway... Each pathway was supposed to have a math, science, English, social studies, and split it up. They wanted to split science up into each pathway. And just to show you the degree to which they were listening, I was adamantly opposed to that, because I figured we go through a lot of patterns and trends in educations, and once you set in stone sinks, electricity, lab stations, that we would be spread out permanently, whereas math, social studies, and English could be reverted back to departmental level. So, the Assistant Superintendent of Instruction, the head architect, an assistant architect, the assistant principal at another building, (name of person) was there, (name of another person) was there as the principal of our older building was there, and I had asked the question and they tried to convince me this was going to be okay. And I asked them at the time, show me one building in this country where that is, and I'd like to go visit them and see how that's worked. They couldn't. They obviously had put their heads together and had some alternatives, and they suggested well, how about if we kept science together and had you on the hub, on what would be like a wheel, so you're together to some degree. Because

we also talked about transporting chemicals and supplies across the building because we share. They came up with a design that worked for science, and indeed that's where we are. We are in the hub of... we are in the upstairs and downstairs of the building like we had in the other building, but the science rooms are all connected, so that we do have shared facilities, so they did listen to that. One thing where it fell down, in terms of the pathways, is we had determined far ahead that Biology should have been part of the Health and Human Services pathway, but it ended up being on a different floor. It ended up being in the Business and Computers pathway. Because you're trying to tie in where courses might make some sense, and so that communication fell apart from the standpoint that, at the point where they started to design the building and put it into one piece, it became really the superintendent and people at the central administration office that made those determinations without communicating with us. That was a lot of back-tracking later on, and it wasn't something that just I was upset about, but also the leader of curriculum in the district was also upset about, but wasn't involved in that decision making either. So as you're looking at how buildings are designed, and the communication process, what I felt happened is we had a very small but select group making decisions without... whenever you have too few heads taking a look at one particular aspect of things, you run the risk of making mistakes. You can move the process forward a lot more quickly, but you run the risk of making mistakes. And we didn't discover this until we took a tour of the building, and all of a sudden we noticed that Biology classrooms were not in the right pathway. They were not on the right floor, and of course then it was too late. By that point, the plumbing, electric, and everything was in. So there... while in the beginning and middle stage, there was a lot of

communication, in the middle to the end there were too few people involved. That left them open to making some mistakes in terms of the intent of the original committee.

Teacher #3 – I came in, basically after my room was roughed out, and had to do a little bit of changes due to value engineering. Items were value engineered out of the program that we had to back in for safety sake.

2.2 Do you recall how individuals were selected to participate in the process?

Teacher #2 – Typically department chairs, or department facilitators as we call them, were asked to be involved. I don't know that anybody was turned away that really wanted to be involved in the schematic design, but the meetings were at seven o'clock at night. For some people that have to commute... I was coaching at the time, so I just teach coach, take off my coaching clothes, shower, dress, and then come right to the meetings. So I was here. But, I don't think anyone was turned away early on in the process. I believe people were chosen based on leaders of certain areas. You know, the athletic director was there representing athletics, and each of the department heads were there representing their core areas, but I don't believe anybody that was really interested was turned away either.

2.3 Did you feel the process gave you an adequate voice in the design of the facility?

Teacher #1 – I remember, just from being at the other building when the process began, that there seemed to be open feedback, and I think they even approached us at first with any ideas, and then it sort of went from there. But I feel like it was a very open process. That's my impression.

Teacher #2 – From my standpoint, it was an open process. All of my science department members felt like they were heard, because the architects didn't just meet with me. It didn't just get keep getting in there under a pipeline. There were points in time where they said we're going to meet with, and I said, look I can't tell you what a physics and science classroom, it's like I can't evaluate that. I need to have everybody there, because there are enough differences in our department. I know in Math that representation that was there left, and didn't want to continue on with the process, for a variety of reasons. There were some things that weren't here then in the building that got left out. There was nobody bird-dogging it all the way through. Now for the reasons, if you get into that, I don't know all the circumstances, but I do know that representation wasn't there for somebody to bird-dog all the way through. So, for example, when they got here they had whiteboards on one set of walls, but not on the back set of walls, and they needed lots of chalkboard or whiteboard space. Well nobody was there to bird-dog that to say well we put that in the specs, and that can't be something that is value engineered out. That has to be here, so that ended up being something that was put back in after the building was supposedly done. And then in the ensuing year after we moved in they were adding those in the back. They didn't feel like they really had enough storage, but again I think there was opportunity for individuals to be there, and it's not always pleasant, and you don't always get everything you want, but you have to stay there if you want to make sure you're protecting your interests. I feel like the people in social studies, English, and Math didn't have as much to lose, in a lot of respects in terms of the design of the rooms, because the basic design is four walls, storage, a place to, you know, that kind of thing.

To give you another example, in Science I had specified that we needed things like document cameras, overhead, that we needed laptops, because at that time the laptops would serve as an analog pick up for all data, because that was the state of technology then. Of course, who knows that they're going to come up with handhelds that everything was going to plug into. So we ended up with 15 laptops with a cart in each of our science rooms that the other departments didn't get. Other departments didn't ask for those kind of things, and when you get in the building people get upset. Why didn't their departments get what? Well I was representing the other departments, I was representing our department, and I bird-dogged everything and made sure we got what we asked for. And typically that would be the only other downside. How often were other people there making sure that their departments were getting everything that they needed? And sometimes people didn't know if they were going to be teaching here or not. I didn't know that if I was going to be teaching here, I just knew that if I was going to be responsible, at this point in time, to take on the responsibility of a new building that was going to be built, that we had a lot to lose if somebody wasn't there.

2.4 What changes might you suggest to improve the involvement of teachers in the process?

3. STUDENT INVOLVEMENT

3.1 Do you recall what efforts, if any, were made to include students in the design process of the new facility?

Teacher #1 – I don't recall.

Teacher #2 – Was there an overwhelming presence of students at the meetings?

No. There might have been one or two there.

Teacher #1 – I was just going to say possibly the SIP Committee, which is shared involvement process, which includes students, parents, and parents, there may have been a little bit of involvement, but probably in the big picture very little, and probably very cursory or preliminary.

3.2 Did you feel the process gave students an adequate voice in the design of the facility?

Teacher #1 – My guess would be no, I doubt it. I can speak with certainty, but that would be my guess.

Teacher #2 – I don't really know. I can't honestly speak... I don't recall about the students being there, and I don't recall that aspect of it. I wasn't necessarily looking for student input in Science. We tend to think that we know it all, as what we've taught in the classroom. We have multiple years of experience in that science classroom, and to ask the students to say well what does or doesn't work in their one hour that they were in your classroom for a year, while it could be important, I can say from my standpoint I wasn't looking for it necessarily. Good or bad.

3.3 Do you believe student input had an impact on the outcome of the design?

Teacher #3 – I think the school store?

Teacher #2 – Do you think that was from students, or do you think it was more from the Business Department?

Teacher #3 – I think it was more from the students, because at a SIP Committee meeting, they talked about it quite a bit. Students were also brought in on the color scheme if I remember right, and the school logo.

Teacher #2 – Not color scheme of the building, color scheme of athletics. They didn't have a say in that. Like we had in the other building, the teal and mauve or whatever. We actually had some input in that, but there were a couple of school board members in particular, a couple of females, that took over the whole task of interior decorating. But the school in particular... that's right, they did in terms of the mascot, and what the school colors were going to be.

Teacher #3 –Right, from the choices that were provided.

Teacher #2 – But their choices were provided, I think, from a committee that included students as well.

Teacher #3 – because of the (name of sports conference). And so they had to work around the parameters they had to select that.

3.4 Do you believe that students were under-represented in the design of the facility?
If so, why do you believe this occurred?

Teacher #1 – I'd have to say that being that you were going to bring in 9th graders or 10th graders, how much of it could they really have gotten into? They wouldn't have been able to design the biology lab or a tech lab or something like that. So it's kind of hard to say what level. Now some students in student government, yes I could see them being very involved in it, but that's kind of a difficult thing to try and gauge.

Teacher #2 – I think from my point of view, they had the opportunity to be involved in the things that were very important to them, like the school colors or the mascot. You know, and for a lot of kids, it's going to be the athletic facilities, but they were represented by their parents and the coaches. In that respect, I was not just involved in the pool, but I was also coaching softball at the time, so I had input regarding the

softball field and what was there. And I think the students interests were represented in the areas that I think were probably most important to them, however I don't know if in student government they said you know, for these kinds of activities that we're in charge of and if we could have some space, I don't know if they had any input to say do we have this kind of space, could we have this kind of space. I know that on the 3rd floor they have some space where they get to store some stuff. I don't know if that was by somebody's design, or luck of the draw that we had some empty space? Or maybe they said something, I don't know?

Teacher #2 – I think a lot of it has to do with the leadership of the students at the time. So we had (name), who had been very involved in student leadership here. She might have... she's had a very vested interest. That hasn't always been the case with all of the student leaders. She might say these are some of the things we've run into with some student government, with some of the student activities and give us some insight in those areas. There are a few students who could make a difference, who are that heavily involved. That I might like... I don't know if they were involved before, but I would want to take a look at that as an opportunity. But I'm not being critical of what we did before.

Teacher #1 – Yeah, I would agree. I would call it adequate, but I think it would be interesting to see what... you know, to invite the students in, and just see... I would imagine that you could possibly get some really good ideas. The other things is, and I'm sure the architect and the district leaders were doing the same thing, but kids talk to friends at other schools and you get... I think it would be interesting to see. I don't

believe it's necessary, and I believe it would be a very small minority of kids who would care enough, but I think it would be interesting to open that up and see.

Teacher #3 – My attention was a little clouded. Watching the students transform the school into the culture that it is, they had a fresh break, a brand new school. The 9th and 10th graders created all this stuff, and to see students like (name) do as well as she's done, would she have had the same opportunity if she was at this school, opening up a new one? This was a wonderful opportunity for those students. To create the first of traditions, all that stuff.

Teacher #2 – And I would say in that sense, something's that come to my mind is that while they weren't as involved in maybe the hardware, they were involved in the software tremendously, of creating the software for this building. They've been very involved, because you're establishing traditions. You're establishing the culture, and I know that (principal's name) has worked very hard to try to bring them in, and we've gotten a fresh start in a lot of different things. And I think they would say they've had a real good opportunity. So maybe not the hardware, but the software once they're in the building.

Teacher #3 – I've heard many parents and students comment, we have a beautiful school, but the people in the school are priceless.

3.5 Do you think that student perceptions are valid? If so, should they play a greater role in the design of school facilities?

No specific responses offered.

4. CONCLUSIONS

4.1 What was your overall impression of the process used to design the new facility?

Teacher #1 – I feel like it was an inclusive process. I feel like everyone did there due diligence. They worked really hard to create a modern building. I can't think of anything that I would change, but it's not really my area of expertise either. I'm pretty happy with what I see.

4.2 What changes, if any, would you make to improve the design process of future schools?

Teacher #2 – I think in the middle, and toward the very end, they got the deciders into too small of a group. And when I say that, when you have your assistant superintendent for curriculum and instruction that's not a part of that group, and she was involved in trying to develop the software, in terms of how the academics were going to work here based upon what we had decided as a, I was on (name of school committee), which was how were we going to design the academics in this building to be different than a traditional (school). And when she wasn't even included in where the academics were going to go, and with what pathways, and on which floors, and what core academics were going to go with which... it fell apart. You had too few people deciding, and suspect it might have been maybe one board member, the Superintendent, the Business and Finance Director, and maybe one other board member, along with the architects. And, like I said, the beginning and the middle of the process were very open-ended, but then I think it got a little small, and the decision making happened a little bit too quickly. And it's not that it turned out to be anything terrible, but it could have avoided some problems.

TRANSCRIPT OF SITE 3 TEACHING STAFF INTERVIEW

This is the transcript from the teaching staff interview at Site 3. The interview was held on February 16, 2011. The outline titles and numbering of this transcript follow the sequence utilized in the Teaching Staff Interview Script found in Appendix G.

2. PROCESS

2.1 What involvement, if any, did each of you have in the planning process for your school?

Teacher #1 – I had a choice for a classroom. I got to pick between two of them down in my wing, which of the two I wanted. I also got to pick my desk furniture, for the tables. And I also got to choose the placement for my track lighting.

Teacher #2 – In the science rooms, I think if we were to survey the school... that we're really happy with the school, but we're not happy with the science rooms. We really weren't part of the process, so as a result, some of the things we were concerned with going into it, we are still concerned with. We did in the process... We were given the plan, and we said this is the worst plan in the world. We had kids facing each other, and it would have been really hard to get them to... in the instructional process. So we took that to the superintendent and he said, okay what do you want. So we told him what we did want (other teacher's voice – plan A and plan B), and he goes well we're not going to do that, but we're going to do this. We said, well we can work with this a lot more than we could the first option, so we really didn't get to choose the format and the plan, but at least we got to say the other plan was not what we wanted.

Teacher #3 – I had quite a bit of input in the television studio area. Also, as it relates the pool, gymnasium, and auditorium, as far as broadcasting back, and sight-lines, and technology requirements, those types of things, and how we use the studio now and what we plan to use it in the future.

Teacher #4 – I didn't really have... you know, we had some basic things we could give our input on, but nothing major from my end.

Teacher #6 – I was on the technology, and then a very small window with the science teachers met.

Teacher #7 – I was hired in this year, so I had no involvement.

Teacher #8 – The bond committee, the community stuff, my wife and I were involved in that. As far as the school goes, no committees.

2.2 Do you recall how individuals were selected to participate in the process?

Teacher # 5 – I have no idea.

Teacher #1 – It was originally set up for me as a furniture meeting, is how mine started. And they showed me on the blueprint, and that was when I had the option to pick between the two rooms. And then we talked about moving my track lighting. So that took place during one of the two lunch times that we had.

Teacher #2 – Our involvement was by default. We saw the plans and said this isn't going to work, and then started... I think (name) even started, (name) called over to the firm and said, this isn't going to work. And he was told don't do that, and this is another way to do that. So that was our involvement.

Teacher #5 – We were not supposed to talk to the architect.

Teacher #2 – Yeah, we were not involved in the process...

Teacher #5 – we had to overstep our boundaries.

2.2 Did you feel the process gave you an adequate voice in the design of the facility?

Teacher #2 – For me, no.

Teacher #3 – For me, yes.

Teacher #1 – I wish I would have had a little better knowledge of reading the blueprint, because I would have taken the other room. (laughter among group) That angled wall really throws me off.

Teacher # 7 – I think they were asked.

Teacher # 6 – For the whole building in general? The only ones that went for the committee... like the technology committee just sent out an e-mail to a few teachers and asked us to go sit in on those to pick out the smart boards, projects and stuff, and so on. For the science, we just met one time to talk a little about it, and that was just every science teacher came down, again a very limited one-time meeting.

2.3 What changes might you suggest to improve the involvement of teachers in the process?

Teacher # 2 – Isn't that a moot point now that the building is completed?

Teacher #5 – Well, we're talking about future.

Interviewer – Correct, this is research for future projects.

Teacher #2 – If you look at the process that (name of another school) went through in their science rooms, their science teachers were involved in the process with the architect, and they're quite happy with it. With us not being involved, there were mistakes that were made that now we have to live with. Like no exhaust fans in the science room, it's crazy. We don't have them, and if we would have been involved, we

would have spotted those things initially. By not being involved, the problems are there and now we're stuck.

Teacher #3 – From my standpoint, the process was really good. And I've told other groups about that, that come in to visit. There was a lot of discussion about what we do with the program now, and what type of projects we do in the current facilities. And then there was a discussion of how might you do it in the future, kind of the wish list or the dream. And looking at... One of the things that was emphasized to me often was don't be short-sighted, just because the technology we have now... it might improve and be much more cost effective ten to fifteen years down the road. So if there's conduit or something like that, put it in place... some of the things you're talking about, and they actually did that. We have the conduit in the studio that runs all the way over to the football field. We're not using it right now, because fiber optics and the cost effectiveness of clarity in that long of a run would be pretty expensive. But like I say, five to ten years from now that might be an easy run for whatever comes after fiber optics.

Teacher #5 – Sounds like the right way to do it.

Teacher #3 – It was a very positive open discussion. It was both the architect and the technology consultant. They talked a lot back and forth, and we met quite a few times.

Teacher # 7 – I think people were asked, but then a person that I knew was asked, you know... I'm going to have to be careful because you're just talking about the design, and there were so many things like furniture and technology and all that stuff too. So that person came to us from that department and asked us what we thought, but she didn't

have to do that. It would have been nice if we would have had an open invitation, that if you're interested just come. If she hadn't done this, we wouldn't have had any say.

Teacher #6 – I would say definitely not. When they met with the science, we were presented with a room set up, what it was going to be like. And there were some definite problems with that, which we were able to speak out a little bit. And there was a process where we kept bringing other ideas that we thought would be at least helpful. Like the first one had the labs around the perimeter of the room, just from supervision we said that would be a bad idea, because you couldn't see what kids are doing. So that was a process just to get how the labs were going to be set up within the room. But then aside from that, we finally just said we'll go with the least of the worst ones, we'll go with this one. But then the set up within the room, you didn't really have any input at all as far as that goes. One thing would be where the clock is in the room. In the other rooms you can see it, but I have to walk ten feet out just to see what time it is. All the storage rooms are all different. They don't have one that we'll lock the chemicals in there, so you have to keep the doors locked or keep them someplace else. There's no fume hoods in the science rooms really. There's one fume hood on the side, but there's no exhaust fans in the ceiling really, just the general ones that are in all the classrooms, so that's not... Some things like this, we could have had some input, because we teach science all the time. Or like the gas, there was a valve to turn it on and off in the hallway, but there was not one in the room. By the fire marshal it has to be unlocked in the hallway, so I would have to check every gas valve every day to turn them off. Otherwise, if the door was unlocked, a kid could come inside the classroom and turn them on and flood the room with gas. So after the fact that had to spend money to go back and add a key switch in every room.

Some of those things could have been taken care of if we would have been talked to and been able to give more input.

Teacher #8 – I think for me, it was more like just go with the flow, here it is, this is the way it is?

Teacher #6 – I would say it's just important to include the teachers. I get that you've got to start somewhere, so you have to present them with something that it's going to be like. But, then that was really the only involvement we had. As things were taking shape, with a little more communication I think we could have made tweaks here and there.

Teacher #7 – Right, it seems that we were maybe asked at the beginning, but then... And we don't obviously do this every day, so some things that you might just go well of course a science room gonna have extra exhaust fans... But just to be like one meeting, hey this, you know we're wondering what you think, and then not to ask anymore. Because it's so new to us, it's overwhelming and takes time to process, so it would be nice to have more involvement as it went through.

Teacher #8 – When you look at it too, you know we're not professionals in this, as far as the logistics and the structure set up. And it's like well we need some background information. For these types of classes this is what you need and how much you need of it. If you look at the structure of the school, you see what the academic wings... that's only a small portion of the building and when you're looking at... between different aspects of the school environment, you also have to include those, whether it's go to directors or coaches, someone that's in that specialty area and say hey what do we need for this, what do we need for that.

3. STUDENT INVOLVEMENT

3.1 Do you recall what efforts, if any, were made to include students in the design process of the new facility?

Teacher #3 – I do know that the principal had selected a handful of student leaders. I don't know other than some cursory things off the top of their head, that they thought would like to see... and I'm guessing they were leaders in...

Teacher #1 – Yeah, I think student counsel, and class president, and things like that. I don't know how many times they met and what kind of input they did have?

Teacher # 6 – It seems like I remember that at some point they just had kids... they just talked to them about what the progress or something, but as far as any input on the design, I never heard anything about that. I think they may have met with a couple of students before...

Teacher #8 – I think they did have a couple of student committees, and if I remember correctly, weren't they putting together the National Honor Society kids to divvy some stuff up or go...

Teacher #7 – I heard about it, but I don't know what they did. I thought they chose...

3.2 Did you feel the process gave students an adequate voice in the design of the facility?

Teacher #3 – I can't really answer that. I'm not really sure how many times met?

Teacher #1 – Yeah, I'm not sure.

Teacher #3 – I know they met maybe once or twice.

Teacher #7 – I talked to students specifically about this, this year, and they said no, this is what we wanted, the classrooms are all the same, they're boring, blah, blah, blah... Which again, you have to take it with a grain of salt because they are kids and they're not going to be happy no matter what. But they do... Some of them feel like it's boring, and even more like a prison than the old school was, because the old school had character.

3.3 Do you believe student input had an impact on the outcome of the design?

Several responses indicating – I don't know or don't recall.

Teacher # 3 – Not that I'm aware of.

Teacher #1 – Not that I'm aware of.

Teacher #5 – I think they're happy with it.

Teacher #1 – Yeah, overall the kids are pretty happy.

Teacher #3 – The one thing they don't understand is, the comment I hear is it's so white!

Teacher #1 – (laughing) Yeah, they say it's sterile.

Teacher #3 - And I explain to them it's like moving into a new house. First you put the blinds up so the neighbors can't see in and then you start to decorate it.

Teacher #1 – Yeah, make it personal

Teacher #3 – and you don't want to walk in on day one and have... this building is going to look different four or five years from now. Everybody will start to customize their own areas and that sterile feeling will wear off and be customized some.

3.4 Do you believe that students were under-represented in the design of the facility?

If so, why do you believe this occurred?

Teacher # 5 – We don't know if they were under-represented, we just don't know the impact that they had. I mean they might have had suggestions, and they were taken in or they were not, but we really don't know.

Teacher #3 – I'm not really sure whose idea the coffee-bar was, but whoever's it was, it was a great idea. I'm amazed in the mornings how many kids come in, and after school and use the commons area for social gathering and then first bell goes off and then they go. They use the area socially and academically.

Teacher #5 – Yeah, a lot of kids get dropped off early, or are picked up late, and they're working in there, so it's very functional.

Teacher # 8 – Well it depends on how many were involved in like the citizens committee and stuff like that. Again, you're going to leave something like that up to the professionals. When you're talking about something of this caliber and size, you know, obviously with the uniqueness... some of it's going to be the same, you know, that cookie-cutter mold. That's what you model it after, and then the teachers put character and design into their individual classroom.

3.5 Do you think that student perceptions are valid? If so, should they play a greater role in the design of school facilities?

Teacher # 3 – I think from an experience standpoint, there are some things that they asked for that were kind of a pipe-dream. There is some reality that has to go in. Kids don't really understand and care a whole lot for keyless entry, and being able to have video cameras... those types of things. That's more of the perspective of an adult, so I don't know if they can really appreciate all the little things that need to be put in

behind the scenes. Like I say, I have no idea if they were the ones who suggested the commons area, or if that was an adult?

4. CONCLUSIONS

4.1 What was your overall impression of the process used to design the new facility?

Teacher # 2 and 5 – We weren't involved.

Teacher #6 – I'd say, I heard that some people had some input in the school, and not that you want everybody to have equal input, but if that's what you do all the time, you probably could have something that would be helpful. You know, they're not an architect, they're not a science teacher, they're not an English teacher or whatever. So there are some things are really good, say like the wing over there (fine arts area), the big room over there, I think they had quite a bit of input in what they wanted like, and what these other side rooms that they needed, and how big to make this and design, and so on. And then the science teachers, we had just to switch the first design, and that was really it. I can't really think of, and I heard the art room had quite a bit of input, but other than that, I can't think of one thing that was changed or imputed from anyone that works here... whether it was from students, or teachers, or anything like that.

Teacher #7 – See it's just like I said about just at the beginning but not at the end. As a teacher, and people I talked to, the stuff we really care about, is like where do we have to put our desk. Different people like it in different spots, and if you have to put it a certain spot, depending on where the hook up is for x, y, & z. That's something that comes in later probably, and when you're asked earlier, or like where the clock is, you know that's stuff that would irritate us every day. That's where it would be nice to have...

Teacher #8 – and some of it, you don't realize how it can be a problem, or how it can be a solution until you go through it and experience it. Again, maybe there should be a list kept, a template teacher list as far as okay this needs to be here, the clock needs to be here, lights here, however it goes, but you have to keep track of besides what's most economical, what's most feasible in the classroom. Does every hook up need to be in the corner over by the window? Obviously with what they have, with the vaulted ceilings and that, they've got the room to move it around. If the wires were run there once, or actually if we've gone wireless, does it have to be in the SW corner by the first pane of glass?

Teacher #7 – if you want to use your smart board. That's the kind of stuff.

Teacher #6 – and I'd say that you have to make the design for not just the teacher, because they're going to come and go, same thing for other employees. But then, like say our lab tables, we had drill holes to come up to go to our computer. Before there was just a big mess that came out on top, and we wanted to get the holes drilled. I would say the design process keeps going, even while you keep making changes and stuff. Luckily I was there. They were going to drill a hole in my lab table way up here, when it could have gone there. So I was there and got them to put it there, but other teachers have it here just because. Even the changes that are made as you keep going, that are just going to come up, there's not any input as far as that either.

4.2 What changes, if any, would you make to improve the design process of future schools?

Teacher # 1 – For people that spend 25 or 30 years in the same room, and I don't know if everybody got what they are going to need for the next 20 or 30 years. So I think,

not to call it a wish list or anything, but to have some type of input where you list five things that you're looking for in your classroom, and you submit it and obviously some of those things aren't going to be feasible, your wish list or whatever. But some of those things, if you start to see trends between certain teachers, this seems like something they're very interested in, let's maybe consider something that we didn't before-hand. When you're talking to people who have only been in the classroom through twelfth grade and then through college, and then that's it. That's not where they work, or not their office. They don't know what it is that they need to carry out their job, and what it is that the students need to carry out their job every day.

Teacher #3 – And taking into account the expertise. For me to walk in and answer questions about a science room would be pretty ridiculous, but for somebody that's taught in a science room, they know the things that they need. Taking that expertise and making use of that resource is very important. Just like somebody coming into my area would not have a clue why we do things the way we do. The more resources you have available... I know they are very time consuming, but they are long term decisions that are going to stay with the building for years and years to come.

Teacher #2 – I guess in hindsight looking at it, we may have been asked initially, and I can't even remember if there was anyone from science involved in it, but it seemed like it was initial and not an ongoing, okay here's what we have so far, how's that fitting? There was maybe initially, hey maybe we're moving to the corner, but we weren't part of that process. I think we should stay a part of that process as it continues to evolve, versus just maybe just at the beginning.

Teacher #3 – my experience was maybe a little bit different in that we spent a lot of time talking about how we use it, and then I didn't see the architect or the technology consultant for probably close to six months. They went back and sketched up some things and put some thought on paper. They brought it back and we talked about what was really good about it, or what things could be tweaked. Sometimes they told me some things that can't be changed because that's a support wall. You can't move, or that's gotta be there. Okay well then you work around those issues. But the second time around they listened and we talked again about what works, what doesn't work. They made adjustments, and then came back another time with a little more firmed up plans. By that time, there were maybe just a couple more little tweaks, and then they disappeared. Then the actual blueprint was ready to roll. So I had two or three cracks at it, which I understand was different, but... It was a great process. I felt like what's up there is pretty much the way I envisioned it and I'm very happy with it.

Teacher #1 – one of the things I hear like staff members and some of the students is the academic wing, other than like the science rooms, they're all the same. It's like you can go into (name's) room, or go into my room and there's no difference. I think some of that will have to come with the... we have to personalize it and things like that, but you walk in and there's cabinets here, and three windows here, and whiteboards on this wall, one wall that color... you know, just a little bit more maybe variety.

Teacher #5 – That could possibly be too that the school we came from had many time frames (laughter)... we used to diversity, and now it's not, but I have heard that same comment.

Teacher #3 – the only other functional thing I hear kids talk about is going from the second floor in what I call the far-east part of the building, coming over to my section, they have to go down the stairs and then travel up another set of stairs. They don't understand why it has to be that way, but again there are beams and...

Teacher # 8 – It needs to be more user-friendly. However you got there, I think for a lot of us, it's like we were so used to the old and dingy, so the new building... Anything seemed a whole lot better. But the whole process itself, yes there's always room for improvement, you can always find and tweak things as need be, but to get there it needs to be more user-friendly.

Teacher # 7 – I think if you were going to take this and say what would I do differently to involve teachers, I would take things that now that we know that it bugs me that this is in this spot... that we wouldn't have thought of because for ten or twenty years it was always in the same spot. So I would as an exit interview say what didn't you like, and I would use that to make a questionnaire for the next set of teachers. Formulate a questionnaire put it online and allow anybody from this site to so it. Because they're not going to think of it until it's changed. I know I didn't.

Teacher #8 – or until they need it changed.

Teacher #7 – yeah, like what don't you like about what's in your building today, or more specific than that, but just to take what people would say now and try and make a questionnaire to try and make people think ahead for the next construction. Because the everyday stuff doesn't just pop into your head. Obviously the art teacher, and the science teachers, and those guys have very specific things that you would see ahead of time.

Teacher #6 – One thing I would suggest, take some teachers, and take them through like a drawing of what it's going to look like, or a room that you designed before and take them through. Because even something like, you've got the shower in the lab, but there's no drain in the floor for that. I don't know if that's something you don't do anymore, but you think that you would want the kids... You think you would want the kids to be able to breathe when we're doing a lab, but there's nothing we can do. What are we supposed to do, turn the fan on? We've got the fume hood, and no window that opens, so do we just open the door and send it to the hallway? It's safety things, just like the gas jets were, it just doesn't make sense to have such little input from the teachers.

Teacher #8 – when you're looking at the little things, to be nit-picky, like in the athletic wings, where's there a drinking fountain? I think there's maybe one on that side? Two, in the coaches room, they have a handicapped shower in the coaches room and the bench doesn't... Again, when you're getting down to the nitty-gritty, and you're looking at the big picture, you have to get down to the small details.

Teacher #7 – and I think that's what matters most to the teachers.

Additional comments followed relating to other items. A lot of comments and discussion related to small details within the classrooms and general building areas. Bottom line sentiments indicated that more involvement would always be better for the teacher.

TRANSCRIPT OF SITE 4 TEACHING STAFF INTERVIEW

This is the transcript from the teaching staff interview at Site 4. The interview was held on May 25, 2011. The outline titles and numbering of this transcript follow the sequence utilized in the Teaching Staff Interview Script found in Appendix G.

2. PROCESS

2.1 What involvement, if any, did each of you have in the planning process for your school?

Teacher #1 – I was allowed to draw out my room, and lay out the furniture, and lay every aspect of my room out. I still have those drawings, and they laid my room out exactly as I wanted it, except for the bathrooms. They didn't give me my own bathroom that I wanted, but other than that, my room is exactly, almost to the foot, what I wanted. As far as student input, I don't remember that there was any student input on the design. From a teaching point of view, and remembering back to that process, I don't think I wanted any student input to be honest with you, because I'm the one that's gotta be in that room for 30 years, and the kid doesn't. So, my perspective was, I need my room to be functional for what I do in there.

Teacher #2 – I came in just as they had already submitted the plans for the kitchen, for the culinary arts department. And what I really think that needed to happen, which did not happen, was they needed to have an executive chef or a chef come in to help design the kitchen, not a company that sells equipment. Because the kitchen ends up being designed for what equipment fits, for what they want to get rid of, or need to,

thinking it's what needs to be done to run the program properly. So, I would actually have a certified chef in on the process of it, and then what I would do for student input, I would bring in the students who were in the program prior, and have them input it, or have kids that have gone to culinary classes at the college level come in to see their aspect of it, what should be in a high school, and what they need to continue on and make it a little easier.

Teacher #3 – I had none.

Teacher #4 – I'm with the business department, and at the time there was three of us. I don't think we drew out what we wanted, but we told our director just what we really wanted, you know like, how many printers, how many computers, and they just designed it for us and we approved their design. But as far as state requirements, we needed so many square feet per student, and so many stations for the kids. That's what I remember.

Teacher #5 – I was part of the design process to, and I actually was able to go to... Well, actually we figured out what we wanted to build first, because I do the construction class. And one of the thoughts was, in some of the programs throughout the State, and actually I should say others states too, but they built modular homes inside their tech labs, so we visited a number of modular home manufacturers and took some of their ideas, and talked to their managers and brought it back here to the architects, and drew everything up. It was relatively close to what we drew up in the very beginning. It was pretty darn close. Other than we had to add another 20 or 30 feet on the outside, but we had to make some budget cuts and it got a little bit smaller. But still, I mean it's great size-wise. But we got pretty close to what we had originally talked about.

2.2 Do you recall how individuals were selected to participate in the process?

Teacher #1 – It was each program, whoever was in each program, unless the person wasn't there yet.

Teacher 4 – All of the vocational teachers were a part of it.

Teacher #1 – The IT instructor was here, did that one. The drafting teacher did theirs, so each department had input.

Teacher #2 – but we didn't have a culinary arts teacher then, so we had the head of the lunch program at the high school help with the design, so it was geared more towards that than an actual lab for culinary students.

2.3 Did you feel the process gave you an adequate voice in the design of the facility?

Teacher #4 – I think so.

Teacher #1 – Absolutely, I think it was great.

Teacher #5 – Yes.

2.4 What changes might you suggest to improve the involvement of teachers in the process?

Teacher #1 – well, hindsight being what it is, I know we each had a lot of say in our individual areas, but now that we've been here in the building a while, I look at stuff like the location of the one, no I guess there's two locations for staff bathrooms, and I'm going, you know after we got through with our individual areas, we had a little say in overall color scheme and things like that, but after that, the final things like conference room locations, bathrooms, and your general areas...

Teacher #4 – Even student bathrooms.

Teacher #1 – ...all that kind of stuff, we didn't really look at any of that. We just got to see the final sketch and it all looked good. We were happy to get our new area, but there were some things that were kind of overlooked by all of us in the group. There were just a couple of administrators that said, did they meet the requirements, but they didn't really care where they were or anything.

3. STUDENT INVOLVEMENT

3.1 Do you recall what efforts, if any, were made to include students in the design process of the new facility?

Teacher #1 – I don't remember any kids being a part of this.

Teacher #2 – and I can't imagine including them even now.

Teacher #1 – yeah, I just don't think there was to be honest with you. I don't think anybody sat around and said, hey where's the kids involved in this?

3.2 Did you feel the process gave students an adequate voice in the design of the facility?

No responses offered.

3.3 Do you believe student input had an impact on the outcome of the design?

Several responded "No".

3.4 Do you believe that students were under-represented in the design of the facility?

If so, why do you believe this occurred?

(laughter among the group)

Teacher #1 – no.

Teacher #2 – they weren't even in the process.

Teacher #1 – They weren't even a part of the process. It goes back I guess to my mentality, you know, I don't know, I think I know best as to my room, and what my room needs to be laid out, and know what's functional and what's not. Would I take student input? I would only take student input like (name) said. I would only take student input from a kid who had been through the program for three years and then came back and had something to say. Do I want student input from a 9th or 10th grader who don't know anything about what we do? No, I don't. I don't want their input.

Teacher #5 – They would want bigger bathrooms,

Teacher #4 – ...more snack time.

Teacher #1 – Yeah, I really... especially when it comes to specialized areas like us, electronics, culinary, business... I don't want student input from a kid who don't know our area.

Teacher #5 – Yeah, I don't really think they would really have much of an input. What could they come up with? Except for a student who went on to college and then came back, because they would see it in a different perspective than I would, and they would have more experience and be definitely serious in that field. So yeah, that would be big input there. But beyond that, 9th, 10th, 11th? Nah...

Teacher #1 – Yeah, I mean, I really don't want their input unless it's something to do with lockers, or maybe bathroom locations, maybe color, and that's a maybe. I mean, that's about it.

Teacher #3 – they're still very, too immature to make those decisions. I mean, they can't even clean up their own rooms, so... I mean to be honest, they don't clean up their classroom, and they don't even tuck in their chair, so we wouldn't even want to

open that door. I wouldn't. I shouldn't speak for all of us. I wouldn't want to open that door.

Teacher #1 – well this is a pretty specialized building. You know, this doesn't have just a bunch of common classrooms, and they're all square boxes, and this is more specialized of a place with more specialized curriculum, so I think maybe we're more guarded.

Teacher #5 – yeah, because at least in my class, I'm looking for safety. That's a huge issue. If you design a classroom that has windows, I can close it off to the lab out there, but I can still see through so that if a kids working in the classroom and out in the lab, I've got windows to see both. And, a student's not going to come in and tell me that. Why don't you put windows in here so you can see that? They don't even think of that stuff...

Teacher #1 – they might go the other way. (laughter among group)

Teacher #5 – so, I don't see how a student would be able to look at a classroom that way.

3.5 Do you think that student perceptions are valid? If so, should they play a greater role in the design of school facilities?

No responses offered.

4. CONCLUSIONS

4.1 What was your overall impression of the process used to design the new facility?

No responses offered.

4.2 What changes, if any, would you make to improve the design process of future schools?

Teacher #2 – You might want to involve parents that are very supportive of building a new building, for funding purposes. Just to get them in, and let them know this is what we're looking for, this is what your students will be sitting in. That's a great voice to have, because when it comes to bond issues and everything else, then we get the money we need to put the facility into what we need, and also so we don't have to budget cut at the last minute. And that's sometimes a positive and a negative, but you know what parents you want in here, because there's parents who are putting their third kid through the same school. They no longer will want to have an input.

Appendix M

Transcripts of Principal Interview Sessions

TRANSCRIPT OF SITE 1 PRINCIPAL INTERVIEW

This is the transcript from the interview of the principal at Site 1. The interview was held on January 19, 2011. The outline titles and numbering of this transcript follow the sequence utilized in the Principal Interview Script found in Appendix I.

2. PROCESS

2.1 What involvement, if any, did you have in the planning process for your school?

I don't know that anyone really defined my role, but initially I was part of what was called the Design Management Team. That really, I think what the intent was, again no one really defined it, but (they said) we want some input from your staff. Collect a group of your staff members, form a committee. We'd like to hear what they want in the facility. We've already heard what the community wants. We've had several community discussions which we've led and we've tried to prioritize what the community wants. Now we'd like to hear from the staff and would also like to take the staff on some tours of other buildings. So, initially I facilitated that. That was summer number one which was 2003-2004. After 2004, that was a summer of fun, we then developed a project management team. And that was school board members, superintendent, facilities director, and each principal was then invited to be on the project management team. In particular, I sat on all three building levels, so the reason I did that was we had a collective bond to improve both buildings and also build a new high school. So the building that I was at which is now our middle school was being renovated from the high school into a middle school, so there was a lot of involvement I had to have with that.

And I did want to see how the money flowed from the renovation of the elementary school to the middle school and to the construction of the new high school. What we did in those project management teams was everything, from the color of the bricks on the exterior, to how the interior was going to look, how it was going to be heated and cooled, how the sound system was going to work, to what technology needs classroom teachers were going to have. And again, I would bring teachers into it occasionally, but more and more as it came closer to the construction of this building, it became highly administrative.

2.2 Do you recall how individuals were selected to participate in the process?

I think the architects led us to having teachers involved in this. They helped us set that up. This is how most schools do it. This is how it should work. You know, who is in charge of your class? Who would like to decide what the classrooms look like? Find some teachers to help with that. Who should decide what the gym looks like? Who is your team, who do we work with? Obviously if you are going to design a gym, you're going to have basketball coaches, volleyball coaches, heavily involved in that because they are the ones using that space the most. If you're designing a classroom, really it's everybody, but I picked a few teachers. If you're designing the art room, you're going to talk to the art teachers. And that's how it started initially. Once we got an idea of what it was going to look like, we kind of disconnected from them and started going about the business of getting it done.

2.3 Did you feel the process gave you an adequate voice in the design of the facility?

I did feel that I was given a voice. I would tell you that I often felt like the low man. My voice was being heard, but obviously your board committee members and your

superintendent are pulling the most weight. That's who the architect was listening to. It's not really your question, but I did notice that and responded to like most people would. I tried to find people outside that room that would listen to me, and I would leverage my authority that way. Some things they gave me... I realize this isn't the question, but you're not really prepared for that. No one has ever gone through and taught me how to build a football field, but they were asking my opinion on all that, and they wanted to know how I wanted it done. So from something as extreme as that, right down to how should your counseling office be designed, it would get surprisingly... they would go from not really wanting your opinion, they're talking about an elevator shaft and how much you want to spend on it to all of a sudden, what's the ideal classroom? I always kind of reflected back, I would get very frustrated in those meetings, because there was no way to prepare for what you were going to get.

2.4 What changes might you suggest to improve the involvement of principals in the process?

If you have someone on the committee who is making decisions, they should be qualified in some way. You know, there were things that I actually signed off on that... I mean you just got so much. It's like they would put so much in front of you to sign off on. I don't think I understood the magnitude of my authority at that point. Everything would go through the superintendent and then all of a sudden, stuff would come to me. Like a gym floor, I would find myself like, no I don't want it to look that way, and all of a sudden I would find myself in charge of the gym. Because I was the one who would say I don't want it to be the way you say it, I want it to be different, and they would say, well can you sign off on that? Well, there's hundreds of thousands of dollars associated with

that signature. I guess if I had to go through it, if I had to give advice, you should almost have a protocol established. I don't bring my teachers into a meeting to decide what our grading system is going to be without establishing a protocol. If you just say, "what do you want?" you're going to get a bunch of different things. And you might listen to the loudest voice, you might listen to the senior teacher, but that protocol should be established. This is how we're going to make decisions. Is it going to be consensus? Is there going to be checks and balances? I think the nature of a project management team is that there will be checks and balances, and that it will get to the board eventually for the final approval, but I don't think it did. I think they were overwhelmed, like me.

3. STUDENT INVOLVEMENT

3.1 Do you recall what efforts, if any, were made to include students in the design process of the new facility?

I'd say the most obvious one was really our gymnasium. There are multiple floors you can purchase. There are some that they are recommending and quite frankly I didn't care, but I had some athletes at the time that I... it's like I wanted to test drive. So give me a list of, if you've got four different floors that you're recommending, that people buy, where are these floors? We would literally drive around, and bounce basketballs and do things on them. I would get their feedback on what they liked. So, that was a pretty cool moment for me, because I did appreciate... their feedback was very genuine and I think they felt very good about what they could offer at that point. A couple of times, when it got to be just something kind of simple, like what logo should we put on the gym floor, I would literally walk into the cafeteria with hundreds of kids and just sit down at

the table and say, what do you think? Which one do you like? Classrooms, we didn't give them much of anything. That was very much an adult-driven process.

3.2 Did you feel the process gave students an adequate voice in the design of the facility?

I would say I was comfortable with it. I wasn't comfortable with them making some of the classroom decisions, and I just frankly didn't include them.

3.3 Do you believe student input had an impact on the outcome of the design?

Definitely. It's going to look, it's going to be shaped a certain way. There's a certain amount of square footage that we're given. So, it doesn't impact that. But once you get down to it can be this big, it has this footprint, this much square feet is dedicated to the gym, the cafeteria is going to fit like this. You don't get to decide so much how it is shaped, but what do you want? How do you think a lunch should work? What do you want? Do you like having chairs that slide in and out? Would you be okay if I ordered tables that just have fixed seating? We would do stuff like that. I think we probably could have made some of the decisions with or without their input, but I learned a little bit in the process. I found that the time I put into those things was beneficial. They felt good about it, and I learned things from it. Decisions were made based on what they told us. But I don't think anyone ever said, it could be whatever you want. It was very guided.

3.4 Do you believe that students were under-represented in the design of the facility?

If so, why do you believe this occurred?

If I had to do it all over again, I would seek more input. Like I said before, there should have been some protocols established, with the adults in charge. It was kind of haphazard. They were like, hey what do the kids think? I don't know, I didn't really think

to ask them. So, sometimes you would just put a committee together and just ask them. But, if I had to do it all over again, I would use a model like I did with something as simple as the gym floor. Like, where do you learn best? How do you learn? But it's a very big question, because I'm a very different administrator now. I can walk through this building and I can tell you that a teaching technique known as cues and questions, where a teacher stands up and gives you some information and then asks you for feedback on that, is a very common lecturing style. With or without PowerPoint or anything, it takes place. Probably about 80 percent of our teaching is cues and questions. I didn't know that at the time, I didn't think that's what it is, but the classrooms that we have reinforce that, and that's all people tend to know. So, really sitting down with kids and asking them questions like, how do you learn best? How does daylight make you feel? We didn't do any of that, we just made some assumptions. But you know, anything we talked to students about like that would have to be jointly discussed with the teachers. We kind of left both of them out. I would say they were kind of under-represented. I would like to represent them more. The architects, I would think, having gone through this multiple times, would have a better understanding of how that works, but quite frankly they are not educators, so we should have been pushing back in that manner. We were all too young and inexperienced though.

3.5 Do you think that student perceptions are valid? If so, should they play a greater role in the design of school facilities?

I'm going to keep qualifying this. Yes they are valid with the right protocols. They quickly... just like teaching staff, it quickly degenerates into things that are not related to achievement and education. You know, you want bigger parking spaces, you

want comfy chairs, you want a teachers' lounge on every floor. So, to just sit down and do what we did, which was to say what do you guys really want? You know it was everything from an equestrian ring to an outdoor amphitheater. I don't like that, because that's unrealistic. With a certain amount of protocol, with questions developed under the guise of, look we're going to try and extract genuine learning styles from these conversations, and incorporate that into our design. That's what I would try to do differently. So yes, if you ask them with the right protocols, it will be valuable.

4. CONCLUSIONS

4.1 What was your overall impression of the process used to design the new facility?

I would say it's... I was initially very critical of it. Didn't like it, it frustrated me. I could never define my actual role. I didn't know what I was in charge of, and then I was in charge of it. I didn't start appreciating it until the team dissolved, and I became the expert on it. Then I started to understand it better, and I had to promote it. I had to ignore the frustrating stuff and become a positive promoter. I could make some analogies probably, but I would say how I feel about it, and the entire staff felt about it. It wasn't really ours until a couple of years later. We opened the doors in 2006, and I don't think really anybody like the process or the building from an employee standpoint. The community loved it, and the kids loved it, it was beautiful. But, it started to become ours within a couple of years. At that point, the board and superintendent were perceived, and I think rightly so, they were the decision makers. They were going to make sure they got what they wanted. And I'm okay with that, because they are the ones you hold accountable. Which is why I would generate so much frustration, because if you're the one accountable, and yet I'm the one signing off on it, you really have empowered me to

make a lot of the decisions, and yet I was kind of a behind the scenes decision maker. I think right from the get go, if we would have established how that was going to go, I think we could have gotten more buy in. But, I also know that in any program you start brand new, it takes a leader to say, this is where we're going to go. And I see that feeling perpetuated over and over again. I can come up with the greatest idea that will revolutionize education, and people won't embrace it for a while. The newness, the stuff in this building that was revolutionary, the pride didn't start showing for a couple of years because I think it really wasn't... this is what you're going to do, whether you like it or not. This is a LEED certified building, and you're going to teach to that. And people responded to that like most humans do. After all those people went away and it was just us, and we could just interact with the kids and their appreciation of it, it started to become ours. Then you got a different sense of pride.

4.2 What changes, if any, would you make to improve the design process of future schools?

I mentioned that the classrooms... you sit down with a teacher who's been teaching English for twenty years, and you say what would you like your classroom to be, they would pretty much describe the classroom that they already have. So, that's why I keep emphasizing protocols. If you extract from that individual what he or she values, what he or she envisions as good teaching, and you will probably come up with a different design. In our particular case, as I look back on it, we probably would have developed more flexible classrooms, more moveable walls, spaces that could change. There are days when you can teach every single freshman in the building English. There are days when you should only be teaching five or six of them, and you've got a space

that's designed for thirty, and you can't do anything more with that. And, it drives everything, and I would have changed that.

I think the architect should be, if they are packaging themselves as a designer of schools, they should have people at the table that are experts. Again, it depends on your client. If your clients are well versed in this, you might not need to lead as much, but we weren't. This was our first crack at this as administrators and board members. I do hold them accountable, the architect in particular, I think they should have more accountable to the expertise, the educational expertise and how we arrive at that. And again, they did it, they would say they did, but when you sit down with a hundred people and say what do you want. That's a piece of it, but it should have been more refined, and they should have led it.

At some point, I felt like they were vendor driven. I felt like they were showing me only one company that does this. I don't see any variation. I think that a part of doing business. Sometimes you're tied to certain vendors. Resistance was futile at times and other times we would get what we wanted. I thought the construction manager's role in that was interesting, because that's when you could start to see the separate meetings. And you could feel the animosity from the CM and the architect. In our case we were more often tied to the CM and they were telling us, they're not doing that right, they can do a better job, and there are more options out there. Probably some of my opinions are skewed because I did end up trusting the CM a little bit more so than the architect. When I got the answers I needed, they often came from construction people.

TRANSCRIPT OF SITE 2 PRINCIPAL INTERVIEW

This is the transcript from the interview of the principal at Site 2. The interview was held on April 5, 2011. The outline titles and numbering of this transcript follow the sequence utilized in the Principal Interview Script found in Appendix I.

2. PROCESS

2.1 What involvement, if any, did you have in the planning process for your school?

I was the principal at the district's other high school. I was involved in the entire design process. What we did, was each segment of the school we invited teachers from those departments to give what they thought as being valuable when designing that component. So, when it came time for the media center, we invited the librarian, the science department, we invited the science teachers, and they each gave input as to what they were seeking regarding the building of that component. I was involved in the planning and on that committee that listened to each of the components and each of the departments. The spaces, the amenities... everything that would allow for a quality educational program was in those departments.

2.2 Do you recall how individuals were selected to participate in the process?

No specific responses to this question.

2.3 Did you feel the process gave you an adequate voice in the design of the facility?

Yes, absolutely, 100 percent.

2.4 What changes might you suggest to improve the involvement of principals in the process?

No, the teachers were involved, we involved community members, we had students that were involved. All parts of the educational community were involved in that. In addition, I also set up trips to visit other high schools, to look at brand new high schools to take a look at how their components were. When we were building our pool, or building our media center, we were able to look at other structures, and then we were able to either concur or make modifications on our request based on what we observed.

3. STUDENT INVOLVEMENT

3.1 Do you recall what efforts, if any, were made to include students in the design process of the new facility?

Students were involved on the committee that met as we talked about the various components. The greatest voice really came from the expertise of teachers, but students were involved and were able to give their opinions as to what they might be looking for in the student areas. For example, when we talked about the commons, the lunch area, the tables, the social component, students were able to voice their opinion as to what they would like to have seen.

3.2 Did you feel the process gave students an adequate voice in the design of the facility?

Absolutely, I think everybody, in my opinion, really had an adequate voice in terms of giving input.

3.3 Do you believe student input had an impact on the outcome of the design?

Yes, I think the students gave input with regard to the commons and the seating, what we would for in terms of greater comfort for the students, and a more social atmosphere with regard to the lunch hour. They also gave input in terms of some of the equipment, lab stations, smaller teacher ratio with regard to working with teachers in lab areas. All that played a part.

3.4 Do you believe that students were under-represented in the design of the facility?
If so, why do you believe this occurred?

No, I think students had adequate representation and gave input to areas they were knowledgeable about or which they felt were of the utmost importance to them.

3.5 Do you think that student perceptions are valid? If so, should they play a greater role in the design of school facilities?

I consider it to be valid for certain areas, probably not as great as the teacher input. The teachers spoke from a teaching point of view in terms of content, in terms of carrying out that content, in terms of maximizing learning, and I think the greater voice really rests with the teachers from those departments; room size, equipment, space and layout of space. That in my opinion probably carried the most weight. ...to content and delivering that curriculum. I think there is a weighting, and you know, you want to allude first of all to those who have the experience. Then there are certain areas that kids wanted to see, that was certainly important. Myself, as an administrator, to be able to oversee the entire process, and put in place a philosophy that integrated the disciplines, that was listened to and that was put in place in terms of faculty lounges, and then so on and so forth.

4. CONCLUSIONS

4.1 What was your overall impression of the process used to design the new facility?

I made a comment in one of the meetings that I wanted to see an integration of the disciplines in each of the departments. I didn't want a single faculty lounge, but more so a lounge in each quartile of the building that integrated disciplines and allowed all teachers to meet during lunch hour. That occurred in this building and the physical structure of the building allowed for that. So that was a philosophy that we put in place, and it was. We also took a look at the floor plan in terms of access to the public immediately. At our other high school, the offices are located on the second floor. We wanted something when you came into the new building so that when the public came into the building you would have immediate access to the office. The adjoining counseling area was put in place and yet isolated and separate from the main office and the administration. So, there were various things that were put in place at my suggestion and recommendation.

4.2 What changes, if any, would you make to improve the design process of future schools?

No, I like the design. I like the physical structure of the building. It allows maximized learning among the teachers and maximized learning opportunities for the students.

TRANSCRIPT OF SITE 3 PRINCIPAL INTERVIEW

This is the transcript from the interview of the principal at Site 3. The interview was held on February 16, 2011. The outline titles and numbering of this transcript follow the sequence utilized in the Principal Interview Script found in Appendix I.

2. PROCESS

2.1 What involvement, if any, did you have in the planning process for your school?

I felt like I had an amazing amount of involvement. I was very pleased as building principal, for not just my own role and involvement, but the desire to have students and teachers to be part of the involvement in design. I've never done anything like this before, so I was really amazed at what I was allowed to do.

2.2 Do you recall how individuals were selected to participate in the process?

Yes, I think it was broken up into categories. I can't remember the categories of the top of my head necessarily, but it might have been instructional categories... athletics, fine arts. And then, it was brought to my attention that we were going to have a meeting and we're going to have consultants there, what we would like to have you do is get people involved. Obviously, we can't have every teacher involved for the instructional, so I think I tried to get one person from each department. You know, for athletics we tried to get our AD and a couple of coaches involved. Fine arts, obviously I think all of the fine arts teachers were involved. So, that was the process, and I think staff felt really good about it too, that they were involved really out of the get-go.

2.3 Did you feel the process gave you an adequate voice in the design of the facility?

I certainly felt like I had an adequate voice, but I really think like the way we do things now is... a more important voice was staff... and the students. And I felt like right out of the gate that was encouraged, you know, that we have a blank board here. As a matter of fact, we even took a tour. And parents, or board members, and staff, any staff member that wanted to go could go tour a couple of other designs. I think we were allowed to be a big part of getting people involved. I think that was really important for the design of this building.

2.4 What changes might you suggest to improve the involvement of principals in the process?

I don't think so, as building principal, I know that I felt like I had a big part in it. But again... I felt like I had a big part in it. But again, my big part was involving others. I think that was my role. It was not just what my vision is. Meeting the student and community needs, I felt like my role was to get others involved. Not just my own voice. I think my own voice was heard, of course. But, I really felt as though everything was laid out that I could involve others too.

3. STUDENT INVOLVEMENT

3.1 Do you recall what efforts, if any, were made to include students in the design process of the new facility?

We did get their input on a regular basis. We spoke to student leaders. I know I had a few formal meetings with student leaders with different topics. It could be for example, the cafeteria design. There was a big issue that maybe we were going to close campus, that we were going to building a big enough cafeteria that we were going to

close campus. And I think that was a concern of the kids. So I think the kids, myself, the community like our open campus, and we designed ... I think it had an input on the design of our facilities. I think lockers, it may seem like a real small point, but students wanted their own lockers. They were used to sharing lockers in the old school. Could we design it and have smaller lockers? So, we had meetings to talk to student leaders about lockers, cafeteria... you know, there was a few other topics that I can't remember off the top of my head, but it was... I think their input really ended up in the design of this high school, and I think it made it better, in my opinion. So, the process was there. It was encouraged. I felt like, not just from our architects, but even from our central office, and from me. We need to make sure they have input, not just for input, but I really think some of their ideas made this building better.

3.2 Did you feel the process gave students an adequate voice in the design of the facility?

No specific responses to this question.

3.3 Do you believe student input had an impact on the outcome of the design?

I think it did, and like I say, I know it did. And I was pleasantly... I don't want to say pleasantly surprised, because I had never done anything like this, and I think there were some of our actual formal meetings where we actually had students sit in, with the design meetings. But it was those other meetings that we went to them with ideas and thoughts that were brought directly to the table, so it was really nice.

3.4 Do you believe that students were under-represented in the design of the facility?

If so, why do you believe this occurred?

Hmmm, under-represented? I can't say that they were under-represented. I guess what I would point to, is that we really went more to the student leaders in a lot of ways. Now in picking the student leaders, could we have missed the boat? Like the voice of the kids who weren't the student leaders. I bet that we probably did. I don't know that it had a negative impact on the design. I don't know that I would do it different? I mean, those are the kids that are involved, but I think, could there be a population of students that maybe aren't the student leaders? You know, we kind of got the voice from student leaders. So if I missed the boat, because that would fall on my shoulders, maybe I could have put together a committee of not just student leaders; some tech students who might not be the leaders. I think there's a possibility that I could have done a better job.

3.5 Do you think that student perceptions are valid? If so, should they play a greater role in the design of school facilities?

Reflecting back, I think their voice was probably more important than any of our voices. I think it's that way in a lot of things, and some of their suggestions and ideas, we did. Whether it's the lockers, might sound minor, but there was a consensus among our student leaders at least, that this is what we want out of our lockers. And allowing them input, and then taking it to the table and making it happen... and some teachers had some thoughts too, and the architects and designers had some thoughts. But I think ultimately we kind of went with what the kids wanted. And I think it was different from the

architects, I think it might have even been different than the teachers, and I'm glad that we did what we did.

4. CONCLUSIONS

4.1 What was your overall impression of the process used to design the new facility?

Like I said, I think we were allowed, never having done this before, I was really pleasantly surprised at being allowed to be part of the decision making. I would say this though, I don't think we could ever be a big enough part of it. If I were to go back, I think we could have been a bigger part of some of the decision making processes. But I think I would say that for anybody. Knowing what I know now, I think we were a big part of it, but I think at the building level... and again, this is not a negative, but I think there were some decisions that were more central office, with design than actual high school student-teacher with design. And that probably relates to fiscal management and stuff, so if I had a suggestion, I feel like we as a building could have and should have had a little bit bigger role. I felt it was awesome, but I felt like, looking back now, there are some things where we could have had a bigger role. But I certainly respect and understand that some of it was fiscal. There's no doubt about it. We didn't have a blank check-book. Not that we would have asked for the world. But that would be my suggestion if I were to do it again. For other schools, I don't think you can involve people enough at the building level. Maybe there's a communications piece that goes along with that? I think the architects did, the design people did, the central office did, but I don't think... I think there could have been improvement of that communications piece. It's not really the fault of anybody else, but if I were to do it again, I would have a little better communication. For instance, furniture, there were some things that we did for fiscal reasons, that this is

what we were going to do, and we just did it. And I don't know that it was what was best for learning, or what was best for our teachers. I don't know that we could do it different, but I probably would like that part of the process to have been different.

There was a community piece, I felt like we did get input from the community that I felt good about. But I felt as though at times, there was a community group, those who had helped to get the bond passed... and I felt like, not just as building principal, but I think our kids and our teachers felt like they were probably more kept in the loop. And central office, understandably, looked for their support and ran issues by them that really never got to us. I felt like we were the practitioners, and I certainly understand it, with the politics of it and the fiscal end of it. But I recall in this two or three year process, reflecting back thinking that this group of community leaders sure pulled a lot of weight. And I don't know that their decisions were based on educational decisions. It was more that they wanted, and understandably, again I don't want you to think this was a negative... if you were to do it again, I think our central office, in my opinion, could have done a better job of getting more input from others.

I felt like there were some big decisions that the community group new about, that had been decided, before I even knew about them. I think they were involved, and rightly so as a community voice. But I think there were times that our teachers were heard or even sought. Decisions may have been made, and we went to the community group to get it rubber-stamped, but I do understand it.

4.2 What changes, if any, would you make to improve the design process of future schools?

You're making decisions about building a school that's going to have to last for at least 40 years, I'm guessing at a minimum, and that's I'm sure, people want to play it safe and have a little bit of flexibility. I think the dilemma with the classrooms, is the needs of our students, not just the needs of kids, but the staff... and I don't know that you could ever build a building that would be that flexible for everybody, because it's about the people. Because even in our own building, do you go by grade level, or do you go by department? I know there are 9th grade buildings. Do we put our 9th graders together? Even within that, once you get them together, do you integrate subjects? Combine math and science, and put English and social studies together?

I think you have a challenge on your hands, because you have a building with needs to meet such different needs that change so regularly. I think it's a great question, but I really don't know what the answer would be. I don't. I think ultimately, the people make the building work.

I think years ago, it was all about the teacher, and their needs, and they teach. Whether the kids get it or not, it's irrelevant. I'm going to teach, and this is my room and I'm and if the kids fail the class, so be it. And I mean to make it sound bad, but I think most schools are still like that. This building has totally changed that. Our teachers are not committed to teaching, they are committed to the idea that every student will learn. So whether they are teaching in a barn, or a traditional classroom, or if I put them in the auditorium, I don't think there can be any excuses for that. And I don't think we could have done that five years ago. I think today... education has been in the dark ages, you

know, since the farming days, a hundred, two-hundred years ago. I think just recently, and I speak for this building, and our results are showing it, the focus isn't on the teachers and teaching. The focus is on learning and I think the more that changes the more facilities can probably then adapt.

In Europe for instance, the teachers go from room to room and the kids stay there. I mean, you talk about a change. I think we could do that today. I don't know if it's the right thing. The key is, what enhances student learning the most? That, to me, would be the key to any facility. What enhances safety, instructions... whatever we do with the facility needs to be geared toward student learning.

TRANSCRIPT OF SITE 4 PRINCIPAL #1 INTERVIEW

This is the transcript from the interview of Principal #1 at Site 4. The interview was held on May 25, 2011. The outline titles and numbering of this transcript follow the sequence utilized in the Principal Interview Script found in Appendix I.

2. PROCESS

2.1 What involvement, if any, did you have in the planning process for your school?

No response. Not the principal at time of design.

2.2 Do you recall how individuals were selected to participate in the process?

No response. Not the principal at time of design.

2.3 Did you feel the process gave you an adequate voice in the design of the facility?

No response. Not the principal at time of design.

2.4 What changes might you suggest to improve the involvement of principals in the process?

No response. Not the principal at time of design.

3. STUDENT INVOLVEMENT

3.1 Do you recall what efforts, if any, were made to include students in the design process of the new facility?

No response. Not the principal at time of design.

3.2 Did you feel the process gave students an adequate voice in the design of the facility?

No response. Not the principal at time of design.

3.3 Do you believe student input had an impact on the outcome of the design?

No response. Not the principal at time of design.

3.4 Do you believe that students were under-represented in the design of the facility?

If so, why do you believe this occurred?

No response. Not the principal at time of design.

3.5 Do you think that student perceptions are valid? If so, should they play a greater role in the design of school facilities?

I really don't see any purpose in seeking student involvement during the planning process of a high school. Like my teachers, I would have to question the maturity level of high school students, and their ability to provide meaningful input.

4. CONCLUSIONS

4.1 What was your overall impression of the process used to design the new facility?

No response. Not the principal at time of design.

4.2 What changes, if any, would you make to improve the design process of future schools?

No specific responses offered.

TRANSCRIPT OF SITE 4 PRINCIPAL #2 INTERVIEW

This is the transcript from the interview of Principal #2 at Site 4. The interview was held on October 27, 2011. The outline titles and numbering of this transcript follow the sequence utilized in the Principal Interview Script found in Appendix I.

2. PROCESS

2.1 What involvement, if any, did you have in the planning process for your school?

I was the career and technical education director for the school district at the time. As a matter of fact, for (name 1) Schools and (name 2) Schools, because we ran shared programs. So I had kind of dual responsibilities and we talked about having to do something with our current high school, because if you have been by the original high school, it's land-locked on both sides. There's no more room to build. We had been trying to get to the paradigm of a new high school, and the taxpayers would not support it because the price was so phenomenal. We had been to other high schools. We visited so many other places it was crazy.

So, at that time there was also another impetus, and that was the School Work Opportunities Act of 1995, which was to identify careers and kids, and put them together, and that kind of thing. So we decided to marry those two things together, and to building this new building, move all of the so-called vocational programs to the new building. That would free up, because shop takes a tremendous amount of space, free up some real estate for other existing classrooms, and see if we could get by that way for a few years, with the idea being that at some point we would flesh (school name) out into a separate

high school. Now that's a long standing goal of the district, because that property was originally bought to be a high school, and the middle school that sits on the South side of the property now was built, the infrastructure of the that building was built to be a high school. And, I'm probably one of the few people left that still knows that. So, the idea was at some point to just build the thing out into a high school, to move the middle school kids to the existing high school, and kind of just redo the whole school district.

The problem came about, because you can only float a bond issue for a certain amount of money. So your plan... you're building it backwards is what you're doing. I was opposed to just having the vocational classes down there, because what typically happens with those places is that they become special education places. You've seen it before. It's the kids who get on the bus and they go to the other school, stigmatized and identified by the student body. And I had originally told the superintendent no, I wasn't interested in it, go talk to somebody else. But then at the same time, we were sending our math/science kids to the (name) Math/Science Center, which I don't know whether you know where that is, but it's way down on the South side of (name). And I said, let's see if we could marry those two together, because I think they're an ideal marriage. So we began curriculum studies on developing our own Math/Science high school, and as far as I know, that's still running. We decided to go with the two ends and put them together, with the idea of fleshing the whole thing out into a high school. The architect actually has drawings of the thing in his back pocket.

We proceeded to go to the community and get the money to build it. That building only cost 20 million, which I thought, was cheap for the number of square feet we got in there. We opened the building in 2002. We added three vocational programs. We added

the total math/science center. When you're going to have chaos, just go it all at once. (laughter) That was my theory, just do it all at once. We also move some of the core curriculum classes down that some of the other kids had to take. We had an English and social studies and we kept moving things down there. Basically because we had outgrown the other high school. The (existing) high school was just overflowing at that time. It was crazy. The last year we all at the high school, every room was used every hour. And a building can't sustain that, it just starts falling apart, and that building was nothing to talk about to begin with.

I led the design process, both for the math/science part ... we developed the curriculum and the building for the math/science center. I met for two years with those teachers. I brought people in that were running math/science centers. We identified kids that we thought would be candidates for that math/science center. In addition to that, we wrote some very detailed specifications for the vocational programs, I mean down to which way the doors went. Every machine went a certain place, every plug, everything was detailed out. We gave those to the architect. It was a book about that thick. As a result of that, he (the architect) came back to us with the original design and we kept tweaking it. And, we couldn't tweak it too much more, because I think they were digging the footings while we were tweaking. But you can move certain things around if you want. We tweaked it right up until the night before the kids showed up. It was crazy. But, that's initially how that was developed. And I can sit here and tell you that the building was designed from the curriculum. It was not designed from, you want a hundred thousand square feet, here it is, because I said I was not going to be a part of another one of those. Everybody pretty much got what they wanted.

2.2 Do you recall how individuals were selected to participate in the process?

It was pretty all inclusive. You basically, you've got one teacher who teaches machine shop, you've got one that teaches electronics. We pulled those people in, and said in an ideal situation, what would you want? We kept meeting with people, and I developed a format for the specification, and then everybody plugged all their stuff into the format. How many square feet you needed? How many students you had to sea? We picked out all the furniture in there. All that furniture came from Germany, it's really nice furniture. So it's a completely different concept for a school.

2.3 Did you feel the process gave you an adequate voice in the design of the facility?

Oh yeah, I think so. Matter of fact, it was kind of scary because at some point, I kind of looked behind me and I went, wait a minute, (laughter) this thing has got my name on it. If it bombs, you know, we're in trouble. I had a whole lot of latitude there. Met with the construction manager every Wednesday, and... The reason a lot of that had to happen was the political climate in the school district was, no one was in charge. We started out with an interim superintendent, and she didn't even get an interview for the job. So like who you dealing with there, right? I had a couple of board members in my pocket, and I'm not a person who likes to deal with board members. That's the superintendent's job. But when you see something crumbling before your face, and there's 20 million dollars of the taxpayers money in it, you have to do something.

2.4 What changes might you suggest to improve the involvement of principals in the process?

That's difficult, because the principle who starts that project may very well not be the person who ends up with the building. That happens a lot around here. (name) is a good example. He was the principal at (school name) high school. It was designed around a different concept. He was brought in from, I think (State name) or (State name), and he was on the job a whole year before that place ever opened. He recruited staff out of their other high school. That whole thing looked like a really good model for us. As a matter of fact, he was a consultant on our project. Our architect hired him, and then I don't know what happened over there. Things at (school name) got real political for a while.

The basic problem is to get the right people involved in it. It seems like from my observations, from 1970 when I dealt with the first add on at our existing high school, it's kind of switched. The architects decided everything and you moved in the first day and went, oh that's nice. (laughter) To the point now, where I think you really need to get the stakeholders involved. And not... I would say the principal's a good person to get involved, but I think you've got to get the department heads involved. And they're reluctant to do that, it's a lot of extra work. We met every Thursday night from 6 to 9 for about ten weeks, and that's a lot to ask people to come back at night and just keep tweaking it. And I had a couple of board members there and the superintendent would come sometimes. It really worked out well.

3. STUDENT INVOLVEMENT

3.1 Do you recall what efforts, if any, were made to include students in the design process of the new facility?

In the initial design phase there weren't, and maybe that's a problem. But we were into something so new, that I just didn't think about it. I thought, you know what, we're just going to spend a lot of time fooling around with this, and we were under the gun to get this thing done and get some kids out of the other building. So, at first we didn't, but after that we started pulling kids into the process, to the point where the day before we moved in, I had so many kids in that building just moving stuff. I mean, they just came there. It was unbelievable. They would grab boxes and just start sticking them in rooms. I bought so much pizza that week. But I mean, they basically owned that place. They wanted it.

3.2 Did you feel the process gave students an adequate voice in the design of the facility?

Yes, we listened to what the kids had to say in terms of things like hallway widths, lockers: things that we felt they knew about. And basically what those were, if you made a deficiency list of our existing high school, flip it over, that's what they wanted at the other building. They wanted a cafeteria that was big enough. They had some issues with furniture, those kinds of things, lighting.

3.3 Do you believe student input had an impact on the outcome of the design?

I think probably furniture was one. I think the curriculum pretty much drove the design of the building, and we were looking at like new things. For instance, we went from just teaching electronics, to computer networking. We were moving from manual

machining to CNC machining. Those were the kind of things that our advisory groups in the vocational area, and I don't even know, do you know how the vocational advisory committee's work?

Interviewer – no, not really.

That might get at your question. All of the vocational programs in (State name) have an advisory group, people in industry. And they meet once a year, and they review the facilities, they review the curriculum, and they review the budget to make recommendations to the school district and to the teachers, and then we tweak the program. The advisory groups were heavily involved in this. When we designed the machine shop, we brought the advisory group in for machining and said, what do you think? And they said, move this over here, no move this over here, you don't need to do that anymore. So the community itself, and those people basically come from the kids I have out on co-op. If I have 10 or 15 people out in machining areas, we tap their bosses. That's probably why you get the kids that tap your brain back to say that's probably what we should be doing.

3.4 Do you believe that students were under-represented in the design of the facility?

If so, why do you believe this occurred?

If there was a reason, it was just because time was of the essence, and I didn't think that, at certain points, I didn't think we would gain anything by their input. But you've got to remember, this was a specialized school. This isn't a regular high school. At a regular high school, we probably should listen more to the kids.

3.5 Do you think that student perceptions are valid? If so, should they play a greater role in the design of school facilities?

I think at some point, it's good to get student involvement in a lot of things, and I'll give you an example. Just as a side track, when we've hired administrators, I've been on most of those committees. And when we hire a principal, or an assistant principal, I would want a kid on the committee, and I've had some really hilarious over, you want me to do what? They just don't see themselves... You can't thrust people into roles that are so foreign from their knowledge base, or what they do. Sometimes it's valuable and sometimes it's not. That's the way I kind of feel about it, and maybe that's a little uppity, but I think at some point, you need to roll with the people you think you can get the most information out of, and the most data out of to move forward with the project. It's not that we didn't have kids sitting there. The comments that I would get from the kids after the meeting, they would come into my office the next day and go, there were two school board members there, the superintendent was there, and I shook his hand once, and you were there. What was I supposed to say? You know, they just wanted to fade into the woodwork at that point, and I said, just hang in there for another week, you know. We'll get to your point, but kids don't feel comfortable in those kinds of situations a lot of times, and I'm not sure they should be put in those situations.

4. CONCLUSIONS

4.1 What was your overall impression of the process used to design the new facility?

I was very pleased with the design process. I thought we had a good basis for the way the building came out. In other words, from where we started to where we ended was good. We were a little small, but we were a little under budget too. We did a lot of things

to sort of cut costs when the bids came in. That was an ugly process. What's really jerked the rug out from under that place is the state's gone in a whole different direction with this curriculum. I have not to many of the teachers down there since (a couple of them I occasionally e-mail with), but I understand that very few people are teaching the full day in their major. That's not their fault. My own personal bias is I believe this will all blow up in the state's face one day. It's like, we all know this, why are you doing this? Not every kid has to take Algebra II and pass it. We all know that. What's going to happen, when the economy starts up again, people are going to look up and say, what happened to all the skilled trades? They're all my age, they're all gone. And, we're not going to have people who can train them, and that's what they need. They need exposure, and they need training. I think we under-value people who work with their hands. I keep telling kids that there's honor in honorable work. You can be just as good a plumber as you can a surgeon. That troubles me a great deal, and that's probably one of the main reasons that I left. I'm very good friends with the math consultant at the ISD, and she and I get in constant fights about this. The reason this is not going to succeed... Are you familiar with contextual learning? The problem is, none of what they're teaching is contextual okay. I taught electronics for 25 years. Most of the kids in my class told me they learned more math in my class than they did in math class. I said, no you didn't, they just didn't show you what to do with it. And that's the problem. And that's where the vocational classes can really help the academic classes, but we're still in that silo concept. First hour I have math, second hour I've got English, and third hour I've got electronics, and nobody talks to each other. We tried to really break down those barriers. The math and science teachers have done that. They will decide one day the we're going to have chemistry for

an hour and a half, and algebra for twenty minutes. I said, I'm just going to give you a block of time. You can do whatever you want with it. Sometimes they get all the kids together. I can tell you sometimes it's chaos when that happens. Sometimes I had to step into that whole thing and help out, but that was true contextual learning. I always wanted to track those kids through college and see how they're doing. But that's the problem with the State curriculum right now. They don't understand that, because again, they're all silos. You're familiar with the concept of silos, and that building will not be able to function under the silo environment, and no high school should either. And no high school should either, no reasonable high school should.

4.2 What changes, if any, would you make to improve the design process of future schools?

No specific responses offered.

Appendix N

Transcripts of Architect Interview Sessions

TRANSCRIPT OF SITE 1 ARCHITECT INTERVIEW

This is the transcript from the interview of the architect at Site 4. The interview was held on April 19, 2011. The outline titles and numbering of this transcript follow the sequence utilized in the Architect Interview Script found in Appendix K.

2. PROCESS

2.1 Describe your role in the planning process of this facility.

My role was in a project management level, from really the pre-bond, or the pre-voting stage, all the way through to today, because we still continue to help them with things in their building. So, I'm the person who has stayed connected to the project from the very beginning.

2.2 Please indicate who participated in the design process.

Very early in the process, after the vote, we started by touring existing facilities of the same size, and in fact were looking at a prototype that had already been developed for this size school. It had been built in Ohio, and also on the western side of Michigan. We visited the Ohio site with a group of faculty members, board members, and administration. And after looking at that building, we toured some additional high schools that were recently completed, for ideas for the ability to engage the faculty and administration in dialogue about what their specific objectives were, and to really look as you go through this, look for the places where the compromises will be palatable, knowing that going in there will always be compromises.

2.3 How were individuals selected to participate in the process?

Not being active in that process, I would expect that the administration chose leaders among the faculty to represent that. The high school principal would have been a given, and then there were just some particularly active board members, who contributed immensely to the whole process, and were very strong in carrying forward the vision on this project.

Interviewer – did you, or anyone from your firm, ask for specific individuals or roles to be part of the process? Was there anyone that you would have liked to be part of the process that wasn't?

From my perspective, there was no one missing from our experience. If there were staff people not there, we would have raised flags and felt uncomfortable. But the representation was complete enough to do the job well.

2.4 Did you feel the process gave everyone an adequate voice in the design of the facility?

I think that once we got going, the stakeholders were brought in and out of the discussion at the appropriate times. And as we were doing the detail of the design later in the process, we certainly were working directly with the staff within the building to execute the design. I think philosophically, the design team, and I would imagine everyone involved, saw themselves as being advocates for students, at the same time being responsible educators for shaping this environment.

2.5 What changes might you suggest to improve the involvement of others in the process on future school facilities?

I think, always in the wings, is the potential to involve students. They were certainly the obvious constituency not at the table through this. And I think, having seen small efforts of it in the past, that weren't terribly successful, I would remain intrigued to find a successful way to engage students, and have them to be meaningful contributors. That being said, I think everyone at the table, certainly on the design side, and I would like to also believe from the faculty side, are thinking about this as being effective environments for education, and therefore good for student occupancy and student use. So, they are always in the room, but the challenge is how to get them meaningfully engaged.

Interviewer – you mentioned some past experiences where maybe this didn't work very well. Did you have some specific examples in mind?

Just in a general sense. Somewhere over the course of the last 25 years, I know we've had a higher level of student engagement, at some point in projects, and recognized it had real clear boundaries and limitations in that context. And how to go beyond is something that, given another opportunity, given the will of the administration and faculty to go there, I would be excited to go there. I would not take them kicking and screaming.

3. STUDENT INVOLVEMENT

3.1 Do you recall what efforts, if any, were made to include students in the design process of the new facility?

I'm pausing, because I would have to believe that there were some efforts that would have involved the principal, because he was the kind of person that absolutely would have brought the student body in if it contributed meaningfully and added something. And I might not have seen that or been party to it, but... so this is a real soft reply, but the best I can give you is I would not be surprised if it happened when I wasn't watching.

Interviewer – so if I understand correctly, it was more behind the scenes, it wasn't a direct connection between you the designer and the students that were involved?

Yes, that is true. A lot of it was logistical in terms of, when you get into design development, we're going to have 3 or 4 designers interfacing with groups within the building to finish the spaces to their needs.

3.2 Did you feel the process gave students an adequate voice in the design of the facility?

I think, using the term adequate, I would say yes, in the sense that the building was successful and the students would say it was successful. But, the paradigm could always change.

3.3 Do you believe student input had an impact on the outcome of the design?

I would say that I'm not aware of them directly, but I certainly know it happened through the staff.

3.4 Do you believe that students were under-represented in the design of the facility?

If so, why do you believe this occurred?

I guess I don't feel they were under-represented, and we've talked about a number of those reasons, because they have representatives in the process who are looking out for

their concerns and interests. And, those concerns and interests are understood in a fairly organic way with staff and teachers in the classroom setting and being in this social setting really with students on a day-to-day basis. That being said, given the will to engage the students by the faculty and the administration, we could do it, a very different approach to it. I think you would need a commitment from all of the traditional stakeholders to open up and take risks, frankly. I mean, the stakeholders that we haven't spoken of, that are also always in the room, but are not active, are the taxpayers. So very often, that's the other end of the spectrum in my mind. They will, their presence will be felt as a decision is being made, absolutely. So, both of them are not at the table, but they are represented.

Interviewer – so as a planner, you feel that they always have a voice, whether is directly or indirectly?

Yes, right, absolutely.

3.5 Do you think that student perceptions are valid? If so, should they play a greater role in the design of school facilities?

No specific responses to this question.

4. CONCLUSIONS

4.1 What was your overall assessment of the process used to design this facility?

I think the design process, at this building, was very effective. I always will have to primarily credit the administration for having the right people at the table, and the people who were at the table having a really clear idea of what their role was, and how they could impact it. And we haven't talked much about the peripheral pieces that are very important like the operations of the facility, and as we were going forward, this was

a geothermal system, and I'm going to that particularly, because if there was a shortcoming in the process, it was there was not enough communication about how the building would be operated physically, from a physical plant perspective. When you are cutting edge with something like that, it is a challenge for the district to make that leap with their eyes wide open. I think we could have done better to make it clear to them what was involved.

Additional dialogue/comments regarding geothermal system followed.

4.2 What changes, if any, would you make to improve the design process for future schools?

To do the effort justice, I would look forward to having a meaningful dialogue with the leadership in a school district about involving students as sort of an agenda item. It always gets lip-service as an agenda item, and we talk about the values of it to the district, the values of it to the project, and certainly the educational benefits for the students and the faculty. So, I think have a purposeful discussion on that up front, and deciding how to set the dials for the stakeholders and the decision makers.

Prototypes are always a starting point. With a few rare exceptions you are saying, the conceptual thinking exists in this building that is very applicable to what we're going to be building. So, building-A gives you a starting point for building-B, but little else. It really just informs the first 20 percent of your discussion. And, you can go see it and feel it, because what is of great importance to running the building as an administrator, is how you manage 300, 500, 1200 students in a setting. And the management issues can be pretty easily vetted out with a trip. They also help you discover some things you want to

do, and what not to do on those trips. It's probably the absolute best way to jump-start start the process.

TRANSCRIPT OF SITE 2 ARCHITECT INTERVIEW

This is the transcript from the interview of the architect at Site 4. The interview was held on April 13, 2011. The outline titles and numbering of this transcript follow the sequence utilized in the Architect Interview Script found in Appendix K.

2. PROCESS

2.1 Describe your role in the planning process of this facility.

I was the lead designer on the project as well as the project administrator. I led the entire design process from programming and pre-bond actually, through schematic design, design development and then through construction. So, I was the lead person in the programming effort, which was a committee made up of teachers, board members, students. I think there was about 23 people in all, and we went through a programming process, pre-bond to kind of define the size of the school. And then as we got into schematics, that same committee was involved through design and schematic design.

2.2 Please indicate who participated in the design process.

There were some people that were parents, that were heavily involved in booster club, or they were part of the swim program, so they were involved when we talked about athletics. Or, there were parents that were involved in PTA or PTO and things like that. They were parents that were heavily involved in the education and with the schools. There were a couple of board members that were involved, and that was a tie back to the board, so that there was representation there, and the process was better understood and

communicated back to the board, so that it wasn't just a monthly report about what was going on, but there were board members actually involved.

And then, we had different teachers that were selected, and I think the process was combined with the administration, and at the board level of who are the leaders in specific disciplines within the school. So, we had kind of the lead math teacher, whether they were the department chair, or the outspoken math teacher who was always the person trying to lead change. Because, the whole design of the building was to try and change from a very departmental model to a different way of teaching based on the career pathways of the state. So you had to have people who were open-minded to that and weren't going to want to fall back into the departmental model. So there were math people that were developed, there was a team of math teachers. Science both physical and chemistry/physics – one of each discipline. There were people involved from English and humanities, and then there were people involved from athletics. So if I remember, there were people from the swim team and swim program, part of physical education, and then the AD at the time for football and represented the basic sports.

So there was a makeup of each different group that would make up the building, a representation of that. And then there were a few students that were involved. I don't remember if they were class presidents, or anything like that, but there were two or three students involved when we met. And the process of programming schematics is that we would meet twice a month for about three or four hours. And what I did is, I worked with each group, to present to the other group what they thought would be nice to have in the building, what they absolutely had to have, and then why they needed to have. So they were then presenting to their colleagues, if I need ten science rooms, why do I need that,

because the science rooms may reduce the number of classrooms, or it might reduce the size of the gym and the overall project. So, there was a balance of understanding and respect between the different groups. We used that method in the first series of programming and design meetings, of what was desired and what was felt that they needed. And then, we developed floor plans that were reviewed with the whole team.

And it started out very globally on an organizational scale, try to look at, with this new pathways program of the State, we were trying to take liberal arts classes and combine them with an elective grouping, and I'm sure you've heard a little bit of that in your interviews. And I haven't actually gone back to see how it's worked out, but it was a radical difference in trying to put an art studio or a workshop across from a science room or classrooms. They weren't down in a separate wing, so they were defining. And then they had separate work areas, so how does that work, and what would work for them. So these people were going back to their colleagues and kind of getting input in between the meetings, and coming back, and going back and forth. So it was a pretty long process of programming and then schematic design

It was a design by committee. So you can imagine what that was like. We tried to get as broad a spectrum of people, in my mind, that were able to give us as much input as possible, in how we look at this differently.

2.3 How were individuals selected to participate in the process?

For the most part, the selection was done by the school district, them knowing who would be the best to participate, who would be as open minded about the process, because we were coming from a very departmental model, and some people just wanted nothing to do with this new age type of school.

2.4 Did you feel the process gave everyone an adequate voice in the design of the facility?

There were times when, and science was a good example, because science had a very strong voice. And science struggled very much with separating and decentralizing the science spaces, because of the shared equipment, and safety. Those were the two big kickers. So what we ended up with, as a compromise, was basically an inner circle of science and an outer circle of electives, and the classrooms filled in between. It became the two L's that became the H in the plan. So the plan evolved because of that desire for safety within the science labs and creating a shared connection between all of them, so you didn't have multiple preps. But the compromise was separation by level, so there were some science labs on the first floor and some on the second. We were able to stack them to save, from an economic point of construction, but at the same time, we had chemistry near one another and life sciences, so they were able to share equipment. So, I think they adequately got a lot of input and we went back to them. Even as we went into DD we went back to the same group of teachers and got input from them, some more than others. You know, liberal arts, sciences, the humanities, and general classroom, once they understood we were centralizing where the teachers desk was going to be, and back then, where the big monitor was going to be, that was kind of a no brainer. And then it was just a matter of, how many of my colleagues am I near, and how will that work. But the classrooms were generic enough that you could go back to the departmental model. You would just be organized a little different from a departmental standpoint.

I think they got a lot of input actually, and we took a lot of effort to do that. We also had global presentations to the entire school body, or rather the entire staff. We would go to staff meetings and give them progress updates of where we were at, and get some input from that. But as much as you can on a big project like that, have twenty-some people involved with parents, and parents understanding what's going on. The student involvement wasn't quite what I had anticipated, but it's kind of hard with the pressure students have, to get them to spend the amount of time that's required. But I do think that students were aware of what was going on, and they were seeing progress of things as they happened.

Interviewer – Was the majority of representation teachers?

I would say it was more 2/3 teachers and 1/3 parents.

2.5 What changes might you suggest to improve the involvement of others in the process on future school facilities?

What I would do differently today, versus, this was almost ten years ago now when we started planning, because it was a bond actually. But, it was pre Survey Monkey and the internet wasn't quite as strong really all most ten years ago, and doing surveys would have been a lot more difficult, you would probably still be doing them with paper. So I would, today if I had that opportunity again, to do a whole new high school design, with this kind of group, and a district willing to spend the time and involve people, which they did, two things I would do. One, I would try to get a lot more student involvement through surveys. To find out what is important to them from a social standpoint within the school. Not so much from the educational side, and I think we had to interpolate what we knew about their social makeup. And you know you try to create social spaces, based

on how you place them, and in that building the cafeteria was kind of the student entry point, and the media center was right off of it, another departure from the traditional planning model of the media center being somewhere quiet and not central like a Starbucks. At that time we talked about it like a Borders, or Starbucks,... I don't know what it is, a Kindle store now. But the whole idea of centralizing those kind of student spaces, after hours, I would look to get more input on the social side of a building, of that kind of a building, along with the academic side, through surveys, or focus groups, another thing that I've done on college project is intercept interviews. You walk around with a recorder and ask them, what do you think about this, and you get input. Or, you could do it with video cameras.

3. STUDENT INVOLVEMENT

3.1 Do you recall what efforts, if any, were made to include students in the design process of the new facility?

They were included by being an open, there were three or four kids (I think), that were invited to come to the programming and schematic sessions, give input. I think one of the students was involved with the fine arts presentation, you know, of what would be nice and the overall presentation to the group. So we tried as best as we could to involve them in that way, but I think it really boiled down to time and effort that a student could give when they were a senior getting ready to go take the ACT or whatever.

3.2 Did you feel the process gave students an adequate voice in the design of the facility?

I don't think so, I don't think so. But I think it also gave a lot more voice from a teacher perspective than traditionally would be done. But the student voice was kind of...

it wasn't that it was not sought, as much as it was, that the focus was more on the challenge of changing from the departmental model to this more State model. So how do we get the teachers to come along? Adding the students to it just seemed like a ..., kind like a bar to high to climb.

3.3 Do you believe student input had an impact on the outcome of the design?

I think mainly in the student commons, and the idea of connecting the media center to that, as a way when you have a closed campus, as 99% of the schools have now for lunch. You would eat 5 or 10 minutes and have somewhere to go socially. The idea of opening up the media center during lunch was something that one of the students talked about and we pushed hard on the media specialist back then to think that way. You know, no food, no drinks, quiet. We still have a very strong acoustical separation between the spaces, because we weren't sure how well it would be received, and you don't know how things are going to change. But I think that was one thing that was influenced by the student input. And then I would say the other was in the arts, in mainly music and band, and it was mainly because the band instructor, at that time, got a lot of input from his students about how it would be better to get their instruments, you know, more of a functional thing. I think he pushed more for input from behind the scenes. Not that we met with the students individually, but I think he was very connected to his students. So sometimes you rely on the faculty to help you get that input.

3.4 Do you believe that students were under-represented in the design of the facility?

If so, why do you believe this occurred?

Well again, time was one of them, but I do think how I've been influenced in my work since then, changes my attitude about that. And what I mean by that, is doing more

college and university work, there's almost a different respect, in my opinion, for that college student as opposed to a high school student. And, I think if I had the opportunity to do it over again, I would push the district to involve more students, and I would have student focus groups, more student focus groups. The focus was to update faculty, to bring the faculty on board, more than it was the student. Because no one really said this, but I think the perspective is, well the students won't even be here when it opens, so why is their perspective what we should focus on? And I think that's wrong, because I think generation to generation doesn't change so much, that they are still students. So one thing that I think I would personally do different is push to get more student involvement. And it's interesting that I didn't realize that this was part of what your research was about, but it's something I've always thought about and it changed by different projects that I've done since then, which makes what we do more rewarding, in my opinion. That planning process up front, with people, is a heck of a lot more fun than the details.

Years before this project, in another district, we did do a project with focus groups using first and second graders. And it was kind of fun, actually it was a lot of fun because they, we had a big board and we would meet with two or three classes at a time and ask them okay, we're doing a cafeteria addition to your school and what do you want to have in it? And it was kind of like the old Art Linkletter thing at times, you know, kids say the craziest things. You know, roller coasters and those kinds of things. But it was kind of done really to get, to give, those students a sense that this building and this place was a part of their life. It wasn't done so much that we knew we were going to get planning principles out of their comments, as much as that we would get them involved and they would respect it more once it was built. Does that make sense?

3.5 Do you think that student perceptions are valid? If so, should they play a greater role in the design of school facilities?

I agree 100%, and I've seen over the recent years, and I don't know if it's because of my involvement in different projects, going from K-12 to college/university and back and forth, because they are planned a little differently. But I've seen that the older the student, the more their opinion is listened to and valued, and kind of makes sense in life anyway. But I think it's something that can and probably should change. Because now what I hear a lot about is safety, safe and secure. Well what does that mean? Does that mean I make it look like a prison? What makes a student feel safe isn't necessarily what makes a parent feel that their student is safe there. So those are the things that I think would help to have more input from students, to just evaluate their perception of space. You know, we've spent a lot of time in our housing projects, with college and university housing, talking about community and how do you build community. I've talked about it in our firm so people feel like they are part of more than just a job. Well in housing you talk about how you create community within the different buildings. Asking how could you relate that to K-12, would also get students more engaged. And I think one thing would be to get them more engaged in the design and building process, so they would be more engaged in why they are there, and why the building is important as well.

4. CONCLUSIONS

4.1 What was your overall assessment of the process used to design this facility?

The biggest thing is back then we didn't have the technology that we have today. And I think using electronics is a very unique way to get young people to respond. You

know, Facebook, it's interesting what it did during the election previously, so how can you... and I know there's been a lot of talk about how you use Facebook in the process, because e-mail isn't even what students do. So I think it's going to be interesting to see over the next few years how technology changes that input. Because I think you are right, the perception that I have is that people are seeking more input into the design process from the people that ultimately use the buildings, as opposed to just the ones who building them.

At least now we're talking about not having classrooms designed for stand and deliver, but more hands on learning, and there's a lot of those buzzwords that are being thrown out, and I think that slowly how we design schools is changing from that perspective. But there's still that ownership of a classroom. That it is the teacher's space, that is defined by the teacher. And to me, it's more of a control factor in education. But it seems if we can start to change from... I'm seeing it a lot in the project I'm working on now, where they are looking at global education, and China is a huge partnership of theirs. And how do they start to prepare students globally, and it's not just stand and deliver, but it's trying to create students that think and expand beyond what they know in their own neighborhood through connections in digital media and those kinds of partnerships. I think that, the global economy, will change how we look at buildings and how we design them as well.

We're ignoring the multi-tasking generation, and what we think is distracting, as an adult, is part of their world. And how does that environment change based on that perspective of the student? And I think it's just a generational thing that has to happen. But if you look at classrooms and buildings today, they're not much different than the

ones we went to in the 1960s. Maybe different color and a lot less brick in the corridors,
but...

4.2 What changes, if any, would you make to improve the design process for future
schools?

No additional response to this question.

TRANSCRIPT OF SITE 3 ARCHITECT INTERVIEW

This is the transcript from the interview of the architect at Site 3. The interview was held on April 20, 2011. The outline titles and numbering of this transcript follow the sequence utilized in the Architect Interview Script found in Appendix K.

2. PROCESS

2.1 Describe your role in the planning process of this facility.

I would describe myself as the project manager, which included many subcategories/different hats.

- Facilitator of conversations
- Leading participants through the process
- Asking the right questions
- Keeping them informed of progress during process
- Advising them regarding the “right players” or “decision makers” to include in the process

2.2 Please indicate who participated in the design process.

I think the superintendent (of schools) was instrumental in implementing a philosophy of being very inclusive, so there were many teacher/user groups that were developed for the different disciplines – in other words science teachers, math teachers, as well as organizing a citizens committee, a board building and site committee, as well as the administrators, head of facilities...

So I think the process was fairly inclusive, even more so than other projects I have worked on.

2.3 How were individuals selected to participate in the process?

If I remember correctly, at least for the different departments, it was suggested to them that department heads be the spokesmen or point of contact. I think other teachers in those departments were involved in some of the meetings. But as I recall the department heads were sort of targeted to participate.

Researcher - Was that a decision that was made by the superintendent or principal, or was there a consensus that they were the right people to go to?

I think it may have even suggested by us, the architects, and they certainly (the superintendent) concurred with that idea.

2.4 Did you feel the process gave everyone an adequate voice in the design of the facility?

I do. I think they were informed about the process, and what the steps were. The fact that they had multiple meetings with us, at each stage of the design was developed. I do feel like the building was shaped in a large degree by them and their input.

2.5 What changes might you suggest to improve the involvement of others in the process on future school facilities?

I can't really think of too many changes I would make. It was a very good and smooth process, primarily because we had a strong superintendent there, who wanted input, but once input was gathered, that was done and decisions were made and we moved forward.

3. STUDENT INVOLVEMENT

3.1 Do you recall what efforts, if any, were made to include students in the design process of the new facility?

I think there definitely was student involvement, although I would say it was relatively minor. I know that early on that students, I think representatives, I don't know if it was student council?, were asked to review and have input at a couple of meetings we were at. I do think, I did hear that the principal, on his own, had solicited feedback from students. There were plans and drawings that he posted that he would ask for student feedback as students kind of came and went from the office areas.

3.2 Did you feel the process gave students an adequate voice in the design of the facility?

That's kind of a hard question I guess, what adequate is. Because I think it definitely was... I guess I would have, looking back I think more student involvement would have been, was needed, would have been better, probably would have led to some different solutions on things.

Interviewer – Would you say the student involvement was more indirect than direct voice?

I think that's fair.

Interviewer – So it sounds like the input from students came through the principals or teachers as their version of that voice.

Yes.

3.3 Do you believe student input had an impact on the outcome of the design?

I would say there was some. It had primarily to do with spaces, sort of the in-between space if you will, there was a desire to have, for example to improve food service or the cafeteria area, and there was some discussion by the students about having a place that they would actually want to hang out in.

Interviewer – So, maybe the areas more outside the classroom?

Outside the classroom, yes.

3.4 Do you believe that students were under-represented in the design of the facility?

If so, why do you believe this occurred?

Yes, I would say they were.

I think it may have been intentional. You know, especially dealing with the principal, his mindset, his culture that he was cultivating in the school is that you have do everything humanly possible to student-proof the building, so that no damage was done, or that students didn't have any place to hide and do mischievous things... things that were not, definitely not focused on education. Kind of from the perspective of making sure kids didn't do anything you didn't want them to do.

3.5 Do you think that student perceptions are valid? If so, should they play a greater role in the design of school facilities?

It's hard to... I think the students would probably have some difficulty verbalizing what it is that they do find conducive to education, in a way that would be useful to us. There has been research done on education and how students respond to a variety of spaces, finishes and colors... So it's a difficult question I guess. I'd like to see

them have more input. We might, as the architect maybe, need to lead that discussion and have somebody skilled in sort of drawing out from them things. But it's almost like they need something to respond to, and then work from there, start to shape it.

4. CONCLUSIONS

4.1 What was your overall assessment of the process used to design this facility?

I do think overall it went well, and the client was happy, that it met or exceeded their expectations for sure.

4.2 What changes, if any, would you make to improve the design process for future schools?

I think that certainly there are lots of things to be learned, lessons learned, and things that you would do differently. I think I might concentrate more on the inside. I know we spend so much time on the finishes of the building. It certainly would be... I'd say if there's any down-side to the process, it was just the timing of the process. You know we're on such hard deadlines, there's no extra time... the school has to open, so I think it was a certain portion of the building that we just didn't have time to explore and really develop. I do think that the design was definitely heavily teacher-oriented, and I found their desires are not generally education focused. It's about supervision, and it's about them staking out their territory. Some of the ideas we made about changes to the educational environment were met with real resistance.

Interviewer – do you think it's easier for teachers to say what they don't like or want... ?

From my experience, at least on one other project I've been involved in, it takes someone, I don't know if I would go as far as to say revolutionary, but it takes someone

who is thinking outside the box. It takes a force, someone willing to change the culture as opposed to someone who is NOT trying to change the culture. Someone who is less about control... which is funny, because whenever I was in their building, there were always students everywhere without teacher supervision.

We spent a lot of time worrying about nooks and crannies, but after school there are so many kids inside the school (without teachers).

TRANSCRIPT OF SITE 4 ARCHITECT INTERVIEW

This is the transcript from the interview of the architect at Site 4. The interview was held on April 26, 2011. The outline titles and numbering of this transcript follow the sequence utilized in the Architect Interview Script found in Appendix K.

2. PROCESS

2.1 Describe your role in the planning process of this facility.

I served as the lead designer on the project. It was my responsibility to work with the principal and his team to develop the program and design for the facility.

2.2 Please indicate who participated in the design process.

The principal of the building put together a team of teachers and administrators. He also brought in representatives from the local community college, because they were involved in possibly using the space. I believe there were also a couple of students, seniors that were in there, but I have to say it wasn't a mainstay of the principal, he didn't champion it. He had some of his favored students have some input that he talked to, but it wasn't a main tenet of the programming process. That was his decision.

Later, we did have some student input on the process, and I told (the principal) that I wanted to try, I told him this isn't going to be your father's vocational school. We want to try something different, an environment that is more suited to today's students. I wanted a more industrial feel to the space. I wanted to expose the utilities and the components of the building, because they became things that the students would study themselves, the engineering and all that.

2.3 How were individuals selected to participate in the process?

The principal was responsible for the selection. Basically the administration said, here, it's your baby. So, he selected certain teachers from the current high school. I think he raided the high school, if you will, of its best teachers. He got the people he felt he could work with. The physics teacher he liked, and who he thought was great for the kids. The math teacher he liked, he brought them all in. There was probably, I would guess, 12 to 14 staff members on average working with us and programming the spaces. Some spaces even didn't have a teacher assigned yet and so he kind of stood in until he had somebody, because some of them were new programs.

2.4 Did you feel the process gave everyone an adequate voice in the design of the facility?

Yes, absolutely. I felt that we had several meetings where there was not only as groups, but one on one, planning with them. Now, the principal tried to tell them that in a way they could get whatever they wanted, here's a chance to let yourself go. And I have to say, some had difficulty with that. Some reacted right back to where they were in terms of how they might use the space. In some cases that was okay because the program didn't change that much from what they had. In other cases, it required some pushing or challenging to find new ways. A couple of teachers were very, very good. They just opened up and said hey, you're giving me an open field? Okay, hang on, I'm going to tell you what I want. Some withdrew and just said, okay I can work in anything, that sounds fine. And I tried to stimulate their thinking, but sometimes I didn't get their... they weren't all equal, let's put it that way. Some were very involved, very enthused, very

proactive. Others were kind of more reactive. So, it varies, and that's typical. We never get every teacher the same.

2.5 What changes might you suggest to improve the involvement of others in the process on future school facilities?

The one thing that I wish I would have know then, that I know now, is I should have brought more outside expertise in. In educators, specialists from the university level, people from... who could challenge the educational paradoxes. I relied on the principal and his group... I mean I would talk about space and stuff, but never the notion of pushing it to the next level, which is really developing a whole new curriculum, a whole new program, really taking the approach of cross-pollinization to another level.

Probably, in hind-sight, I would have wanted to bring some specific experts in, to stimulate the principals and teachers in a way that I couldn't. That's part of the thing that I know now, to bring in certain people that have expertise in certain areas that can stimulate their thought. Because, we were trying something pretty new, and the principal was the motivator, the one who pushed the trains as far as he could. And relatively speaking, it was quite far. It was really cutting edge. Now I look back on it and say we could have done even more. We could have done this or that. And, I have to hand it to him, because he basically pushed it very hard. He pushed the staff, he pushed himself, he pushed the board. He (the principal) was the champion of the project, really.

3. STUDENT INVOLVEMENT

3.1 Do you recall what efforts, if any, were made to include students in the design process of the new facility?

He (the principal) reviewed a couple of times... we had the materials and the design set up so the students could come in and react to them. It was not a formal process, where there was a review board of students or anything like that. And basically, what the students did was they championed the more industrial, raw approach to the interior that was different than the school was used to. Because if you go look at their existing high school, it is pretty traditional, so they wanted something more of their own. And it was an interesting corollary, because the principal felt very strongly that they (the students) would take ownership. So he brought his students in and the first day, he told them that this was their school, this was for them. And the students saw it as a release from the crowded problematic existing school. They all had a very optimistic point of view, and the students took ownership.

As much as I would like to say it was the design, I have to admit that it was the principal. He made that happen. He was a great leader of that and a constant steward of the place.

I often say, we as architects think we can solve all the problems, but we really can't. Most of the problems are far beyond our ability to solve, and it's really up to the people who use it.

3.2 Did you feel the process gave students an adequate voice in the design of the facility?

No, I don't think it did. Because it wasn't formalized... it was almost, the principal would present the design to the students and they would look at it and say, oh that's cool. They weren't really actively involved in the design of the school. There may have been one or two students that the principal talked to, and I remember I talked to a couple of students, but it was mostly peripheral. It was a direct conscious effort to involve the students. And most of it was because the principal, in his own way, was a control freak, and he wanted to make sure this is the way it's coming. And he was of the opinion, that we're going to give you something great here and you should like it. Their involvement was really just reactive, it wasn't proactive. I would summarize it that way.

3.3 Do you believe student input had an impact on the outcome of the design?

Besides the aesthetics of the building, the industrial interior, it was the café area. The café was seminal because, I'll tell you what... first of all it was wireless, which was new back then. We wanted a nice space where the students could feel like adults. Back then, the notion of a Starbucks, the coffee generation... we wanted to involve them. So I remember one thing in particular, they said don't just put regular cafeteria tables in there. And we designed the space to be pretty open. They asked for the higher, café style tables and chairs, and it just went over great. Because as students came in, they were stopping in there, talking and having a coffee, having their laptop out. All of a sudden, they started feeling more like adults. Like they were in the real world instead of just being in the cafeteria. Allowing them to change it from an institutional setting to a more adult, real-

world setting and they responded very favorably. It has become a gathering spot, a place where they sat and worked on projects together, and then the staff even started to join them in that area.

3.4 Do you believe that students were under-represented in the design of the facility?

If so, why do you believe this occurred?

No responses to this question.

3.5 Do you think that student perceptions are valid? If so, should they play a greater role in the design of school facilities?

Opinion is usually based on some type of experience. I saw this, or can you do it like that. I think that somehow, one is you have to find the right kind of students, ones that would be able to synthesize as well as analyze, to be able to think creatively, and maybe different mixes of students. Secondly, I think you have to train them a little bit. Before you plan a high school, my idea would be that the students themselves go on tours. They would do their own research and look at projects all around the country so they would at least have a working knowledge of what we are trying to do. Just sitting up and say gee what do you think, in your infinite knowledge of 17 years old... my opinion is that if you going to involve students in the design, that you have to give them something to base I on. Involve them in the research and train them. I'm not saying you have to go to architecture school, but give them a basis... We need to give them some tools to get the best out of them.

I think the lack of time can be a factor, but it can also be an excuse. There can be charrettes or some other way to accelerate the process. But mostly, it's really the attitude of the administration that sets it in my opinion. People are sometimes more afraid of the

opinion, that they will lose control. If the principal and administration don't want to foster that, you're in an uphill battle. That's where it starts in my opinion. I think it starts from the top down.

4. CONCLUSIONS

4.1 What was your overall assessment of the process used to design this facility?

I would like to try to involve more students early on in the design process.

4.2 What changes, if any, would you make to improve the design process for future schools?

A couple of things. They are probably not using the facility the way it was intended, but is that anything new. Most facilities I'm involved in change, programs change. But, I was hoping that the seed of the cross-disciplined educational approach would have been implemented.

My biggest regret is that the educational side of the design and programming lost momentum after the building opened.

Interviewer – Could you give me a rough breakdown of which stakeholders had a given percentage of influence on the design?

Architect/Principal – 51%

Teachers – 20%

Students – 5 to 10% maybe (but reactive)

Students were involved during the construction phase. The principal wanted them to see it being built.

Appendix O

Summary of Teacher Perceptions Regarding Student Involvement

TEACHER PERCEPTIONS REGARDING STUDENT INVOLVEMENT

Qualitative data from the interview sessions were analyzed to determine if any specific themes or general tendencies emerged from the statements made by the teachers to indicate a pattern regarding the perception of staff across all four sites. Statements from the interview sessions suggested up to five common perceptions regarding the idea of student involvement among the teachers at all four sites including, (1) indifference toward the idea, (2) questions regarding the maturity level of students, (3) reserved interest, if limited to non-academic areas, (4) receptivity to the idea, or (5) a bias against the idea. This appendix contains a summary of the teacher comments tabulated in Table 41, and indicates the statements from the teachers that correspond to each perception by site.

Statements Indicating Indifference Toward Student Involvement

Site 1

Teacher 2.1 – I don't think it was intentional to leave students out of the planning stage. I just think it is hard for a majority of students...

Teacher 1.1 – I don't think that the thought was there to say let's take a step back and start talking to kids. It was a pretty small school and the thinking... I think maybe when you have a larger school with a bigger student base you would think more about the student population?

Teacher 3.1 – I'm not necessarily saying we should exclude them from an opportunity like this. But at the same time, if they go on a trip... That's an all day trip, and I don't

know how many high school students would give up a whole day just to look at three buildings.

Site 2

Teacher 1.2 – but probably in the big picture very little, and probably very cursory or preliminary.

Teacher 1.2 – I don't believe it's necessary...

Statements Questioning the Maturity Level of Students

Site 1

Teacher 3.1 – I just think it is hard for a majority of students to be able to say, you know, we need to be able to design a school that looks like this, and to be able to actually say this is the function that it's going to serve, this is why we're going to do it this way, this is the advantage of doing it this way, as opposed to saying we want high ceilings, we want big open spaces, we want neat colors.

Teacher 2.1 – I don't know if they have the maturity level for the actual design...

Teacher 3.1 – but what kind of attention span do they have for it? Do they have more than ten or fifteen minutes looking at it and say okay, now I'm bored and I want to go do something else? ... I think that's what it comes down to.

Teacher 2.1 – there are some kids who are very caring and want to do things that benefit the future, but there are some student who say well I don't get to enjoy it, so why would I want to spend all this time working on it.

Teacher 1.1 – you obviously can't ask 9th graders what they want in a building because it's not going to be built before they go.

Site 2

Teacher 2.1 – I'd have to say that being that you were going to bring in 9th graders or 10th graders, how much of it could they really have gotten into?

Teacher 2.1 – I believe it would be a very small minority of kids who would care enough...

Site 3

Teacher 3.3 – There is some reality that has to go in. Kids don't really understand and care a whole lot for keyless entry, and being able to have video cameras... those types of things. That's more of the perspective of an adult, so I don't know if they can really appreciate all the little things that need to be put in behind the scenes.

Teacher 3.7 – again, you have to take it with a grain of salt because they are kids and they're not going to be happy no matter what.

Teacher 3.8 – Again, you're going to leave something like that up to the professionals.

Site 4

Teacher 4.5 – What could they come up with? Except for a student who went on to college and then came back, because they would see it in a different perspective than I would, and they would have more experience and be definitely serious in that field.

Teacher 4.3 – they're still very, too immature to make those decisions.

Teacher 4.5 – I'm looking for safety... and a student's not going to come in and tell me that... They don't even think of that stuff.

Statements Indicating Reserved Interest Toward Student Involvement

Site 1

Teacher 3.1 – but at the same time, I think it's such a... and you have to really look forward, look forward in terms of time to say yes, we can see how this is going to work, and with many students, once they leave school they don't come back. So I'm just wondering if it would have been advantageous to have had some students there, ...

Teacher 3.1 – so it's definitely a community where if a student has siblings, or is one of those community members that generations have gone through, then yes they should be involved in what's going on, because they have a vested interest.

Site 2

Teacher 2.2 – I think from my point of view, they had the opportunity to be involved in the things that were very important to them, like the school colors or the mascot. You know, and for a lot of kids, it's going to be the athletic facilities, but they were represented by their parents and the coaches... and I think the students interests were represented in the areas that I think were probably most important to them...

Teacher 2.2 – they were involved in the software tremendously, of creating the software for this building... So maybe not the hardware, but the software once they're in the building.

Site 3

Teacher 3.3 – I don't know other than some cursory things off the top of their head, that they would like to see.

Site 4

Teacher 4.1 – You know, this doesn't have just a bunch of common classrooms, and they're all square boxes, and this is more specialized of a place with more specialized curriculum, so I think maybe we're more guarded.

Statements Indicating Teachers Were Receptive to Student Involvement

Site 1

Teacher 3.1 – I think we should have included students.

Teacher 1.1 – and I think it's kind of like any time you make a technological change in a business. They say you need to get all users and everybody involved so they can accept the change. You get students involved, maybe they respect the building a little bit more because they had a little bit of a say in the change.

Teacher 3.1 – Obviously involve students would have been number one.

Teacher 5.1 – I think so. I think students have great input.

Site 2

Teacher 2.2 – There are a few students who could make a difference, who are that heavily involved. That I might like... I don't know if they were involved before, but I would want to take a look at that as an opportunity.

Teacher 2.1 – I think it would be interesting to see what... you know, to invite the students in, and just see... I would imagine that you could possibly get some really good ideas.

Statements Indicating Bias Against Student Involvement

Site 2

Student 2.2 – I wasn't necessarily looking for student input in Science. We tend to think that we know it all, as what we've taught in the classroom. We have multiple years of experience in that science classroom, and to ask the students to say well what does or doesn't work in their one hour that they were in your classroom for a year, while it could be important, I can say from my standpoint I wasn't looking for it necessarily. Good or bad.

Teacher 2.1 – I don't believe it's necessary...

Site 3

Teacher 3.8 – you're going to leave something like that up to the professionals. When you're talking about something of this caliber and size, you know, obviously with the uniqueness...

Site 4

Teacher 4.2 – I can't imagine including them even now.

Teacher 4.1 – I don't think anybody sat around and said, hey where's the kids involved in this?

Teacher 4.1 – They weren't even a part of the process. It goes back I guess to my mentality, you know, I don't know, I think I know best as to my room, and what my room needs to be laid out, and know what's functional and what's not. Would I take student input? ... Do I want student input from a 9th or 10th grader who don't know anything about what we do? No, I don't. I don't want their input.

Teacher 4.1 – especially when it comes to specialized areas like us, electronics, culinary, business... I don't want student input from a kid who don't know our area.

Teacher 4.5 – I don't really think they would really have much of an input.

Teacher 4.3 – I wouldn't want to open that door.

Teacher 4.5 – I don't see how a student would be able to look at a classroom that way.

Appendix P

Summary of Principal Perceptions Regarding Student Involvement

PRINCIPAL PERCEPTIONS REGARDING STUDENT INVOLVEMENT

Qualitative data from the principal interview sessions were analyzed to determine if any specific themes or general tendencies emerged from the statements made by the principals to indicate a pattern in the perception across all four sites. Statements from the interview sessions suggested up to four common perceptions regarding the idea of student involvement among the principals of all four sites including, (1) receptivity to the idea, if limited primarily to non-academic areas, (2) that it was secondary to the teacher, or adult input, (3) that it could be done better on future designs, or (4) a bias against the idea. This appendix contains a summary of the principal comments tabulated in Table 42 of Chapter IV, and indicates the statements from the principals that correspond to each of these perceptions by site.

Statements Indicating Receptive to the Idea, If Limited to Non-academic Areas

Site 1

Principal 1.1 – I would get their feedback on what they liked. So, that was a pretty cool moment for me, because I did appreciate... Classrooms, we didn't give them much of anything. That was very much an adult-driven process.

Principal 1.1 – I wasn't comfortable with them making some of the classroom decisions...

Principal 1.1 – I think we probably could have made some of the decisions with or without their input...

Principal 1.1 – If I had to do it all over again, I would seek more input. Like I said before, there should have been some protocols established, with the adults in charge. It was kind of haphazard. They were like, hey what do the kids think? I don't know, I didn't really

think to ask them. So, sometimes you would just put a committee together and just ask them. But, if I had to do it all over again, I would use a model like I did with something as simple as the gym floor.

Principal 1.1 – Yes they are valid with the right protocols. They quickly... just like teaching staff, it quickly degenerates into things that are not related to achievement and education... With a certain amount of protocol, with questions developed under the guise of, look we're going to try and extract genuine learning styles from these conversations, and incorporate that into our design. That's what I would try to do differently. So yes, if you ask them with the right protocols, it will be valuable.

Site 2

Principal 1.2 – students were involved and were able to give their opinions as to what they might be looking for in the student areas. For example, when we talked about the commons, the lunch area, the tables, the social component...

Principal 1.2 – I think students had adequate representation and gave input to areas they were knowledgeable about or which they felt were of the utmost importance to them.

Principal 1.2 – I consider it to be valid for certain areas... Then there are certain areas that kids wanted to see, that was certainly important.

Site 3

Principal 1.3 – We spoke to student leaders. I know I had a few formal meetings with student leaders with different topics. It could be for example, the cafeteria design... I think lockers... We had meetings to talk to student leaders about lockers, cafeteria...

Principal 1.3 – there was a consensus among our student leaders at least, that this is what we want out of our lockers. And allowing them input, and then taking it to the table and

making it happen... I think it was different from the architects, I think it might have even been different than the teachers, and I'm glad that we did what we did.

Site 4

Principal 2.4 – at first we didn't, but after that we started pulling kids into the process...

Yes, we listened to what the kids had to say in terms of things like hallway widths, lockers: things that we felt they knew about.

Principal 2.4 – I think at some point it's good to get student involvement in a lot of things... You can't thrust people into roles that are so foreign from their knowledge base... kids don't feel comfortable in those kinds of situations a lot of times, and I'm not sure if they should be put in those situations.

Statements Indicating Student Input Secondary to Teachers

Site 1

Principal 1.1 – I think the architects led us to having teachers involved in this. They helped us set that up. This is how most schools do it... If you're designing a classroom, really it's everybody, but I picked a few teachers.

Principal 1.1 – Classrooms, we didn't give them (students) much of anything. That was very much an adult-driven process.

Principal 1.1 – But you know, anything we talked to students about like that would have to be jointly discussed with the teachers... I would say they (students) were under-represented.

Site 2

Principal 1.2 – The greatest voice really came from the teachers...

Principal 1.2 – I consider it to be valid for certain areas, probably not as great as the teacher input. The teachers spoke from a teaching point of view in terms of content, in terms of carrying out that content, in terms of maximizing learning, and I think the greater voice really rests with the teachers from those departments; room size, equipment, space and layout of space. That in my opinion probably carried the most weight. ...to content and delivering that curriculum. I think there is a weighting, and you know, you want to allude first of all to those who have the experience.

Site 4

Principal 2.4 – Sometimes it's valuable and sometimes it's not. That's the way I kind of feel about it, and maybe that's a little uppity, but I think at some point, you need to roll with the people you think you can get the most information out of, and the most data out of to move forward with the project.

Statements Indicating That They Could Do Better in Future

Site 1

Principal 1.1 – If I had to do it all over again, I would seek more (student) input.

Principal 1.1 – So, really sitting down with kids and asking them questions like, how do you learn best? How does daylight make you feel? We didn't do any of that, we just made some assumptions... I would like to represent them more.

Principal 1.1 – With a certain amount of protocol, with questions developed under the guise of, look we're going to try and extract genuine learning styles from these conversations, and incorporate that into our design. That's what I would try to do differently. So yes, if you ask them (students) with the right protocols, it will be valuable.

Site 3

Principal 1.3 – Now in picking the student leaders, could we have missed the boat? Like the voice of the kids who weren't the student leaders. I bet that we probably did... So if I missed the boat, because that would fall on my shoulders, maybe I could have put together a committee of not just student leaders; some tech students who might not be the leaders. I think there's a possibility that I could have done a better job.

Site 4

Principal 2.4 – In the initial design phase there weren't, and maybe that's a problem. But we were into something so new, that I just didn't think about it.

Statements Indicating Bias Against Student Involvement

Site 1

Principal 1.1 – I wasn't comfortable with them (students) making some of the classroom decisions, and I just frankly didn't include them.

Site 4

Principal 1.4 – I really don't see any purpose in seeking student involvement during the planning process of a high school. Like my teachers, I would have to question the maturity level of high school students, and their ability to provide meaningful input.

Principal 2.4 – If there was a reason, it was just because time was of the essence, and I didn't think that, at certain points, I didn't think we would gain anything by their input.

But you've got to remember, this was a specialized school. This isn't a regular high school. At a regular high school, we probably should listen more to the kids.

Principal 2.4 – That’s the way I kind of feel about it, and maybe that’s a little uppity, but I think at some point, you need to roll with the people you think you can get the most information out of, and the most data out of to move forward with the project.

Appendix Q

Summary of Architect Perceptions Regarding Student Involvement

ARCHITECT PERCEPTIONS REGARDING STUDENT INVOLVEMENT

Qualitative data from the architect interview sessions were also analyzed to determine if any specific themes or general tendencies emerged from the statements made by the architects to indicate a pattern in the perception across all four sites. Statements from the interview sessions suggested up to four common perceptions regarding the idea of student involvement among the architects of all four sites including, (1) very receptive to the idea, (2) that cooperation would be required from the administrators and educators to make it happen, (3) that it may require additional training, and outside assistance from experts to be effective, or (4) student interests and needs are being represented by the staff, or other adult participants in the process. This appendix contains a summary of the architect comments tabulated in Table 47 of Chapter IV, and indicates the statements from the architects that correspond to each of these perceptions by site.

Statements Indicating They Were Receptive to the Idea

Site 1

Architect 1 – I think, always in the wings, is the potential to involve students.

Architect 1 – Given the opportunity... I would be excited to go there.

Architect 1 – To do the effort justice, I would look forward to having meaningful dialogue with the leadership in a school district about involving students as sort of an agenda item.

Site 2

Architect 2 – I would try to get a lot more student involvement through surveys.

Architect 2 – I think if I had the opportunity to do it over again, I would push the district to involve more students, and I would have student focus groups, more student focus

groups. The focus was to update faculty, to bring the faculty on board, more than it was the student. Because no one really said this, but I think the perspective is, well the students won't even be here when it opens, so why is their perspective what we should focus on? And I think that's wrong, because I think generation to generation doesn't change so much, that they are still students. So one thing that I think I would personally do different is push to get more student involvement.

Architect 2 – I think it's something that can and probably should change... and I think one thing would be to get them more engaged in the design and building process, so they would be more engaged in why they are there, and why the building is important as well.

Site 3

Architect 3 – looking back I think more student involvement would have been, was needed, would have been better, probably would have led to some different solutions on things.

Architect 3 – I'd like to see them have more input.

Site 4

Architect 4 – and I told (the principal) that I wanted to try, I told him this isn't going to be your father's vocational school. We want to try something different, an environment that is more suited to today's students.

Architect 4 – I would like to try to involve more students early on in the design process.

Statements Indicating That Cooperation Would be Required

Site 1

Architect 1 – And how to go beyond is something that, given another opportunity, given the will of the administration and faculty to go there, I would be excited to go there. I would not take them kicking and screaming.

Architect 1 – given the will to engage the students by the faculty and the administration, we could do it, a very different approach to it. I think you would need a commitment from all of the traditional stakeholders to open up and take risks, frankly.

Site 2

Architect 2 – So I would, today if I had that opportunity again, to do a whole new high school design, with this kind of group, and a district willing to spend the time and involve people, which they did, two things I would do. One, I would try to get a lot more student involvement...

Site 3

Architect 3 – It takes a force, someone willing to change the culture as opposed to someone who is NOT trying to change the culture.

Site 4

Architect 4 – I think the lack of time can be a factor, but it can also be an excuse... But mostly, it's really the attitude of the administration that sets it in my opinion. People are sometimes more afraid of the opinion, that they will lose control. If the principal and administration don't want to foster that, you're in an uphill battle. That's where it starts in my opinion. I think it starts from the top down.

Statements Indicating That It Would Require Training and Assistance

Site 1

Architect 1 – I would remain intrigued to find a successful way to engage students, and have them to be meaningful contributors... but the challenge is how to get them meaningfully engaged.

Site 3

Architect 3 – I think the students would probably have some difficulty verbalizing what it is that they do find conducive to education, in a way that would be useful to us. There has been research done on education and how students respond to a variety of spaces, finishes and colors... So it's a difficult question I guess. I'd like to see them have more input. We might, as the architect maybe, need to lead that discussion and have somebody skilled in sort of drawing out from them things. But it's almost like they need something to respond to, and then work from there, start to shape it.

Site 4

Architect 4 – The one thing that I wish I would have know then, that I know now, is I should have brought more outside expertise in. In educators, specialists from the university level, people from... who could challenge the educational paradoxes.

Architect 4 – Because it wasn't formalized... it was almost, the principal would present the design to the students and they would look at it and say, oh that's cool. They weren't really actively involved in the design of the school.

Architect 4 – I think you have to train them a little bit. Before you plan a high school... We need to give them some tools to get the best out of them.

Statements Indicating Students Are Being Represented By Adults

Site 1

Architect 1 – ...I would imagine everyone involved, saw themselves as being advocates for students, at the same time being responsible educators for shaping this environment.

Architect 1 – That being said, I think everyone at the table, certainly on the design side, and I would like to also believe from the faculty side, are thinking about this as being effective environments for education, and therefore good for student occupancy and student use. So, they are always in the room...

Architect 1 – ... I certainly know it happened through the staff.

Architect 1 – I guess I don't feel they were under-represented, and we've talked about a number of those reasons, because they have representatives in the process who are looking out for their concerns and interests.

Architect 1 – both of them are not at the table, but they are represented.

Architect 1 – It always gets lip-service as an agenda item, and we talk about the values of it to the district, the values of it to the project, and certainly the educational benefits for the students and the faculty.

Site 2

Architect 2 – the student voice was kind of... it wasn't that it was not sought, as much as it was, that the focus was more on the challenge of changing from the departmental model to this more State model. So how do we get the teachers to come along? Adding the students to it just seemed like a ..., kind like a bar to high to climb.

Site 3

Interviewer – it sounds like the input from students came through the principals or teachers as their version of that voice.

Architect 3 – Yes.

Site 4

Architect 4 – most of it was because the principal, in his own way, was a control freak, and he wanted to make sure this is the way it's coming. And he was of the opinion, that we're going to give you something great here and you should like it. Their involvement was really just reactive, it wasn't proactive. I would summarize it that way.