AREAS OF KNOWLEDGE NEEDED BY SUPERINTENDENTS AND ARCHITECTS TO ENHANCE THEIR COLLABORATION IN THE SCHOOL DESIGN PROCESS

A Record of Study

by

DEANNA MARIE LOVESMITH

Submitted to the Office of Graduate Studies of
Texas A&M University
in partial fulfillment of the requirements for the degree of

DOCTOR OF EDUCATION

May 2009

Major Subject: Educational Administration

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Approved by:

Co-Chairs of Committee,	Virginia S. Collier
	Lynn M. Burlbaw
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ABSTRACT

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Areas of Knowledge Needed by Superintendents and Architects to Enhance Their Collaboration in the School Design Process. (May 2009)

Deanna Marie Lovesmith, B.S., Baylor University;

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Co-Chairs of Advisory Committee: Dr. Virginia S. Collier
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The purpose of the study was to identify perceptions of the contributions made by superintendents and architects respectively when programming a new school.

Areas of collaboration were determined by a qualitative analysis of the responses of superintendents and architects to questions regarding their perceptions of areas to discuss when collaborating in the designing of a new school. Ninety-four Texas superintendents and forty-six architects participated in the survey.

Major research findings from this study addressed the areas of knowledge needed to enhance the collaboration process. Budget is the driving force within the collaboration between superintendents and architects when designing a school. The superintendent is the key communicator in the design process. Architects are the individuals most concerned with using the instructional delivery methods used by teachers to guide the design process. Three main areas to address when designing a school to support student safety are accessibility, surveillance and visibility. Instructional specialists, specifically

at the district-level, are often not included as a part of the facilities committee. Superintendents obtain knowledge and the skill to collaborate with architects on a school design process through on-the-job experience.

Recommendations are made to further enhance the collaboration. Superintendents and architects need to view budgets as a way to prioritize needs rather than to limit possibilities when designing a school. Superintendents must continue to be aware that they are the lead communicator in the school design process and must continue to work to effectively communicate their district's and community's needs, expectations, and vision. Superintendents must be prepared to communicate instructional delivery methods and expectations to architects when designing a school.

Superintendents and architects need to consider accessibility, camera surveillance, and visibility when designing a school to support student safety. Facilities committees should include district level curriculum experts as part of the school design process, as these individuals are knowledgeable of the district's instructional vision. It is important for superintendents who are designing a school project to have prior experience in participating in the design process, or to collaborate with other superintendents with experience to guide and assist them in the process.

DEDICATION

This work is dedicated to my husband Bruce, my mother Evelyn, and
my mother-in-love, Joanna. Each of you provide continuous love, support and joy in my life. With you, all things are possible.

ACKNOWLEDGEMENTS

The path to a doctorate is marked significantly by those along the way who provide support and encouragement. Without these individuals, the task would be impossible. The next few lines are an attempt to express a sincere thanks to the life-changing contributions each of these individuals has made in impacting my life.

First, I must thank Dr. Lynn Burlbaw and Dr. Virginia Collier. As co-chairs of my committee, you shared the role in contributing to my success. Your vision, support and encouragement carried me through to the final draft. Dr. Burlbaw – you are a master teacher and instilled in me an appreciation for the history that defines the present. Dr. Collier – you are an outstanding example of the accomplishments that women can make in the field of public education. I hope to follow in your footsteps.

I also would like to extend a special thanks to Dr. Bryan Cole and Dr. Luana Zellner. Thank you for completing my committee. Dr. Cole – you define quality. You profoundly changed the way I view organizational processes and my instructional approach to educational situations. Dr. Zellner – thank you for providing great insight into my work and supporting me to the end.

To Dr. Mona Choucair, thank you for perfecting my voice throughout the paper, your professional guidance and new found friendship are cherished.

To my friend, Dr. Tawnya Nail, thank you for your support as we embarked on this journey together. Thanks for being there any minute of any day.

To my mother-in-love Joanna, thank you for moving next door to enhance our lives daily.

"Raise a child up in the way that he should go, and when he is old he will not stray from it." Thank you to my mom who had the vision for this day and raised me with this aspiration from the time I started kindergarten. You will always be my greatest supporter. I know Dad would have loved to have seen this day.

And finally, to my best friend and eternal partner Bruce. Thank you for sharing in my dreams.

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CHAPTER I

INTRODUCTION

"We shape our buildings and then they shape us," stated Winston Churchill (Lawler, 1970). From the original one room schoolhouse to today's state-of-the-art school facilities, the school building serves as a central location for learning. Today, over 50 million students are attending public schools with the number continually rising (U.S. Department of Education, Office of Public Affairs 2000). As these students enter the hallways, half of the U.S. schools have reported facility conditions in need of major repair (Moore & Lackney, 1994). Taylor, Aldrich, and Vlastos (1988) found that the school facility "can be designed, engineered, and provisioned to serve as an additional learning tool" (p.32). Consequently, the building also serves as a learning tool to help shape the education of a student, thus shaping the student. With this in mind, it is important to pay attention to the collaboration between the individuals who bring the greatest contribution toward "shaping" school buildings – the superintendent and the architect. This became the basis for my study.

This record of study follows the style and format of *Journal of Educational Research*.

The Researcher

As a public school administrator, I have experience in working in both old and new facilities. Additionally, I was a student in the U.S. public school system and have a student perspective of the learning environment in a new, well-maintained school versus a school that is in need of repair. My educational background at the masters and doctoral level provided me the opportunity to take two courses in school facilities from two different Texas state universities. My position as a central office administrator in two Texas public school districts afforded me the opportunities to participate in the designing and opening of various school buildings. Through these experiences, I have become even more cognizant of the relationship between the school facility and student learning, thus the need for this study.

The best way for me to conduct this type of study was through a qualitative inquiry. I wanted to have a more-in-depth understanding of the contributions superintendents and architects bring to their conversations when designing a school facility. A qualitative inquiry would allow the researcher to understand the meaning people have constructed about their experiences while being an integral part of the inquiry. In traditional academic writing, the researcher is referred to in the third person; however, there is a shift to the presence of pronouns authors use to refer to themselves when conducting qualitative inquiry (Bogdan & Biklen, 2007). The use of "I" portrays a more honest and direct approach and reminds the reader of the presence of the researcher as the primary instrument for data collection and analysis (Merriam, 2002). Therefore, I will use first person in this study.

Overview of the Problem

The investigative report, *Wolves at the Schoolhouse Door,* brought to our attention the questionable state of the USA's public school infrastructure (Lewis, 1989). The U.S. Department of Education found 21% of U.S. schools are more than fifty years old, and another fifty percent are at least 30 years old (Office of Education Research and Improvement, 2000). These schools now require a total of $127 billion dollars in new construction and retro-fitting (Office of Education Research and Improvement, 2000; U.S. Department of Education, 2007). Moreover, a study by the National Education Association (NEA) doubles the estimate of funds needed to modernize America's schools. Their estimated amount, including the costs of technology, is approximately $322 billion (National Education Agency, 2000).

In addition to the costs for modernization, the location of many public schools exposes them to noise, dust, and danger of the highway. As a result of schools that are small, badly lit, improperly ventilated, and not properly furnished, the education of a large number of school children occurs in "trailers" or portable buildings (Tanner, 2000; U.S. Department of Education, 2007). With large expenditures of taxpayer dollars needed to modernize schools, the design of each school must be carefully considered.

Yet despite the condition of school facilities, the expectation is that all students will learn. Texas' superintendent of schools is responsible for promoting students' success. And under the Texas Administrative Code §242.15, the superintendent is also accountable for the management of the district's physical plant and support systems to ensure a safe and effective learning environment. Given the multiple roles and responsibilities of the Texas superintendent for both the academic excellence of students and the management of the physical plant, the superintendent holds a particular investment in the design of a school facility specifically planned to enhance instruction. It is these interactions between superintendents and architects occurring in the course of planning a building that this paper will address.

Building and repairing school facilities costs taxpayers billions of dollars of federal, state, and local funds. With the focus of educational reform on student achievement, schools must maximize every fiscal resource to support student academic performance. This academic focus combined with limited funds produces a need for school facilities built to facilitate the learning environment.

While there are studies (Earthman & Lemasters, 1998; Lemasters, 1997; Tanner, 2000) on the effect of a school's facility on student achievement, there is a paucity of literature on the specific contribution that superintendents make in the design of schools. Tanner (2000) recognizes raised standards for our students, teachers, and administrators, yet when considering school building design, we seem content to simply depend upon architects to guide us in achieving our goals for student learning. While architects equip the training to design school facilities, they are not as well versed in the learning environment that must exist within the school building. Superintendents have an opportunity to positively influence the design of future schools based on their understanding of the impact of such design on student achievement and their understanding of the community. A strong collaboration between superintendents and architects that draws upon the expertise of each will yield the best school design to meet the needs of the students and communities.

Purpose of the Study

The purpose of this study is to identify the areas of knowledge needed by superintendents and architects to enhance their collaboration in the school design process. Recommendations to address the collaboration can be made for programmatic revisions, professional development, and superintendent preparation programs.

Theoretical Framework

The collaboration between superintendents and architects proves crucial to the school design process. The knowledge that superintendents and architects bring to the collaboration process is further impacted by their experience level, educational background, and school design research. Figure 1 illustrates the theoretical framework for this study.

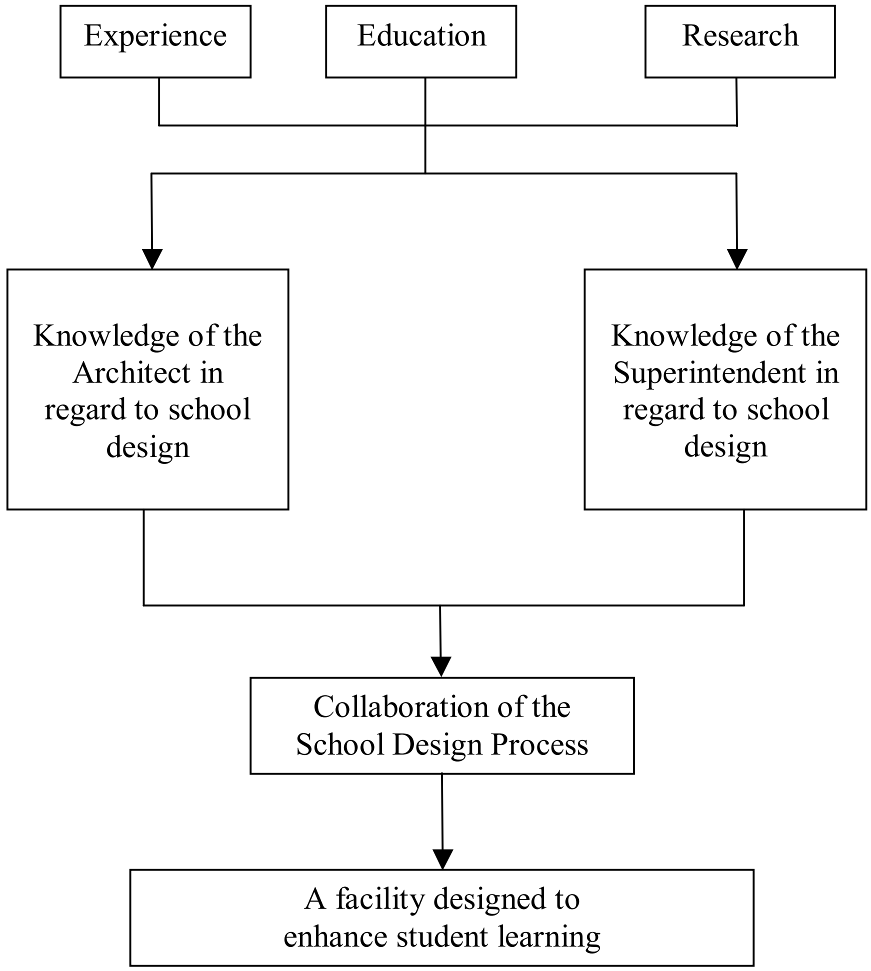

FIGURE 1. Theoretical framework of the collaboration of the school design process.

Research Question

Within the theoretical framework described, this study explored the point of collaboration occurring when superintendents and architects combine their knowledge.

The present study focused on the following specific questions:

1. What information do superintendents and architects need to provide to their counterparts when planning the school design?
2. What information do superintendents and architects need from their counterparts to help them make decisions when planning the school design?
3. What do superintendents and architects expect to see included in a school that supports student learning?
4. What do superintendents and architects expect to see included in a school that supports student safety?
5. Who should be involved in the planning process?
6. Where do superintendents obtain knowledge on how to collaborate with architects when designing a school?

The collaborative effort between superintendents and architects was analyzed in order to identify strengths and weaknesses within the process, by identifying the individual contributions made by each. Identification of these areas will strengthen the design process, and result in facilities which better support student learning.

Operational Definitions

For the purpose of this study, the following definitions apply:

Council for Educational Facility Planners, International (CEFPI) – a professional association whose sole mission is improving the places where children learn. CEFPI members, individuals, institutions, and corporations are actively involved in planning, designing, building, equipping and maintaining schools and colleges.

Designing – the research and decision-making process that identifies the scope of the work to be designed.

Facility – The buildings, amenities, accommodations, and/or equipment designed to serve a particular function (Council of Educational Facility Planners, International 2004). For purposes of this study, the particular function is the instruction of students within a public school district. The facility is a school.

High Performance Buildings – Buildings designed and constructed using practices that significantly reduce or eliminate the negative impact of buildings on occupants and the environment in five broad areas: sensitive site planning, safeguarding water & water efficiency, conserving materials & resources, energy efficiency & renewable energy, and indoor environmental quality (American Institute of Architects, 2007).

School architects – architects who, as defined by their membership in CEFPI, have a specific interest in designing schools, and experience in doing so.

Superintendent – chief executive officer of a school district with experience in designing a school.

Student Achievement – The measured academic performance of students based on standardized scores on Texas Assessment of Knowledge and Skills tests.

Assumptions

1. The respondents surveyed will understand the purpose and significance of the research study and will respond honestly.
2. Potential architect respondents are assumed to be members of CEFPI.

Limitations

1. The findings of this study are based on the opinions of the respondents.
2. Study data is limited by the number of superintendents and architects responding to the voluntary survey.
3. Architects who are not members of CEFPI may have experience in building schools, but their views will not be collected because of the use of the CEFPI distribution list as the distribution mechanism for architect surveys.

Delimitations

1. There was no attempt to generalize information in this study beyond Texas.

Record of Study Contents

There are five chapters in this record of study: an introduction, statement of the problem, purpose of the study, operational definitions, assumptions and limitations, and the significance of the study, are all provided in Chapter I. A review of the literature is found in Chapter II. Chapter III includes a description of the methodology employed, a description of the participants, research design, development and validation of data collection, and data analysis. Chapter IV contains the analysis of the data collected in the study. Finally, Chapter V provides a summary of the findings from this study and implications from those findings. Recommendations for practices and directions for future research are presented in this chapter as well.

CHAPTER II

REVIEW OF THE LITERATURE

Given the rise in the growing population of students, the construction of school facilities is occurring at a fast rate. Many existing schools require significant repairs to maintain educational standards needed among school populations. With the increase in costs to maintain or to build new schools, and with a national focus of educational reform on student achievement, every fiscal resource must support student academic performance. Combined with limited funds, the academic focus produced a need for school facilities built to facilitate the learning environment. A strong collaboration between superintendents and architects that draws upon the expertise of each will produce the best school design to meet the needs of the students and communities.

The purpose of the literature review is to develop a context from the pertinent literature that explains the study as outlined in the first section of this paper. The literature review also supports the study of the collaboration between superintendents and architects when designing school facilities that maximizes the use of fiscal resources and the educational impact on student achievement. The review will begin with research on the need for new schools in the U.S., followed by research about the design of 21st century schools to meet societal changes. While there is little research focusing on the collaboration between superintendents and architects when designing school facilities, there is some new research focusing on future-based visioning in school planning and the design process.

The Need for New Schools

School capacity

A 21st century challenge for U.S. schools will be the facility capacity available to house a growing population of students educated in America. From 1977 to 1990, the number of children born in the U.S. increased by 25 percent, reaching a peak of 4.1 million births (Binger, Quinn & Sullivan, 2003). By 2000, there were approximately 53.6 million students in kindergarten through grade 12 as compared to 28 million in the 1930's (Kennedy, 2003). With the number of children between five and seventeen estimated to increase by 6 percent in the next twenty years, the total school enrollment is projected to be 60 million by 2030 (U.S. Department of Education, Office of Public Affairs 2000). This rate of growth can overwhelm a district's ability to predict and plan for designing and building schools. In addition to new school facilities, existing facilities will deteriorate and need replacement (Kennedy, 2003).

Class size and student achievement

Student enrollment growth has increased both the number and size of schools being built. The number of Texas high schools with over 2,000 students and elementary and middle schools with over 900 students is significantly increasing (Texas Education

Agency, 1999). A report by the Texas Education Agency (TEA) found studies that support "academic achievement of many students suffers at large schools. Smaller schools are thought to be more efficient at providing conditions more conducive to student learning. One of those conditions is smaller classes" (TEA, 1999, p.1). Farber (1998) concluded that gains for reading and mathematics are best for all students, regardless of wealth, who attend high schools with 600 to 900 students. Glass, et al (1982) demonstrated student achievement continues to improve as class size is reduced and as the years of participation in small classes increase. TEA (1999) found that small classes support an environment that often leads to more direct attention to students, wider use of resources, increased use of instructional methods, greater student participation, higher teacher morale and fewer class disruptions. TEA (1999) found that class size reductions have been associated with the greatest impact on student achievement when classes are reduced below 20 students.

The U.S. Department of Education (USDE) created the Smaller Learning Communities (SLC) program "as a response to growing national concerns about students too often lost and alienated in large, impersonal high schools, as well as concerns about school safety and low levels of achievement and graduation for many students" (USDE, 2008, p.1). Findings from the first implementation of the program indicate that high schools implementing SLC programs have an upward trend in student extracurricular participation before and after program participation. There was a statistically significant positive trend in the percentage of 9th grade students being promoted to 10th grade and an increased percentage of graduating students reporting they planned to attend college (USDE, 2008).

Facility conditions

The U.S. Department of Education found 21% of U.S. schools are more than fifty years old and another fifty percent are at least 30 years old (Office of Education Research and Improvement, 2000). Repairing and updating these schools now require a total of $127 billion dollars in new construction and retro-fitting (Office of Education Research and Improvement, 2000; U.S. Department of Education, 2007). A study by the National Education Association (NEA) doubled the estimate of funds needed to modernize America's schools. School infrastructure included new school construction, additions to existing buildings, renovations, retrofitting, deferred maintenance, and major improvements to grounds. Educational technology, including computers and peripherals, software connectivity, networks, technology infrastructure, distance education, maintenance and repair of technology equipment, technology-related professional development, and ongoing support for teachers were also included. Taking all of this into account, the NEA established a figure of approximately $322 billion needed to repair U.S. schools (National Education Agency, 2000).

With 50% of schools in the U.S. built in the 1960s and a projected life of over 35 years, this leaves half of the schools in the U.S. in need of major improvements (Moore & Lackney, 1994). While attendance in school is required, some school facilities are not safe:

> Crumbling schools is not just an inner city problem. It is not a problem for poor children, or for minority children … it is an American problem and it relates directly to our future. America can't compete if our students can't learn; and our students can't learn if their schools are falling down. (Earthman & Lemasters, 1998, p.13)

Crumbling buildings as the learning environment for children do not contribute to improving student achievement. Learning becomes secondary to the basic need for a stable structure.

In 1995, the U.S. General Accounting Office (GAO) surveyed 10,000 public schools across the United States. The GAO asked school officials about (1) the physical condition of buildings and major building features, (2) the status of environmental conditions, (3) the amount districts and schools had spent in the last 3 years or plan to spend in the next 3 years due to federal mandates, and (4) an estimate of the total cost of needed repairs, renovations, and modernizations to put schools in good overall condition. Based on the findings from this survey, the GAO found that one-third of the schools, approximately 14 million students in attendance, reported needing extensive repair or replacement of one or more buildings (U.S. General Accounting Office, 1995).

A follow-up report by the GAO profiling the condition of schools by state, approximately half of the schools in Texas had at least one inadequate feature or building. The same report noted that 30% of Texas schools reported insufficient technology capacity and 25% lacked appropriate science laboratory space to meet state and national educational needs (U.S. General Accounting Office, 1996).

Five years later, the National Center for Educational Statistics completed a report on the condition of America's public school facilities, based on the results from a questionnaire from 903 public elementary and secondary schools in the United States. The results indicated that 75% of the schools responding to the questionnaire were in need of repair or upgrades to put their schools into overall good condition (Office Education Research and Improvement, 2000). Of these schools, those with the highest concentration of poverty (70 percent or more students eligible for free or reduced lunch prices) were more likely to report that at least one building feature was in less than adequate condition. Approximately forty-three percent of the schools reported at least one of the six environmental factors (lighting, heating, ventilation, indoor air quality, acoustics or noise control, and physical security of buildings) was in unsatisfactory condition, and two-thirds of those schools had more than one environmental condition in unsatisfactory condition. As a result of this study, 25% of the schools, enrolling approximately 11 million students, reported schools in less than adequate condition. Of these schools, there were approximately 3.5 million students enrolled in a school reported in poor condition (Office Education Research and Improvement, 2000).

Crampton and Thompson (2002) analyzed the unmet funding needs for school infrastructure across the United States. Based on their findings, Texas ranked fifth in the nation in 2000 in the amount of dollars need to bring school infrastructure to an acceptable condition. So, obviously, something must be done to address the crisis of the condition of school facilities and the environment in which students are learning in U.S. public schools.

Climate environment

Beyond the physical condition of the school plant, national reports of America's schools noted extensive needs in relation to the school climate within the school (U.S. General Accounting Office, 1995). While improvement in student achievement largely credits the effectiveness of the classroom teacher and the leadership of the school administrator, the condition of the school facility building provides the environment in which teachers and administrators perform their duties. Hoy and Miskel (2005) defined school climate as:

> a broad term that refers to the teachers' perceptions of the general work environment of the school; the formal organization, informal organization, personalities of the participants, and organizational leadership influence it. Put simply, the set of internal characteristics that distinguish one school from another and influence the behavior of each school's members is the organizational climate (p.185).

The conditions of the school facility obviously influence the school climate. When considering the role of the school facility as a variable that impacts the climate of student learning, Rivlin and Wolfe (1985) made the following statement:

> It is because the physical environment reflects and helps to define a system of social relationships and the person as part of that system that people-environment transactions have symbolic as well as personal meanings. The physical environment conveys what is expected, what is normative, what is acceptable and

> taboo, defining in the end the individuals sense of self and competence as well as how that individual is perceived by others (p.46).

Approximately half of the U.S. public schools have facility conditions that are in major need of repair, thus causing physical environments that negatively impact the organizational climate in many schools (U.S. General Accounting Office, 1995).

When looking at the impact of the climate environment on students, Green (2002) found that well-designed buildings and pleasant surroundings lead to better behavior (including attendance and concentration) and attitudes (such as motivation and self-esteem). Pritchard (1987) compared student attitudes in new versus old facilities. The results were similar to other studies: social climate factors perceived by both students and teachers were considerably more favorable in the new school. The students perceived higher expectations of learning when there was an awareness of the importance of safety and orderliness in the school, greater clarity of the school's mission, more monitoring of student progress, and greater interaction between parents and school administration in a good building.

In a study of over 20,000 students, Cheng (1994) found a relation between students' attitudes toward the school facility and their attitude toward homework and intentions of completing high school. Effective classrooms, which correlated with positive student outcomes, were equipped with appropriate physical facilities, having enough space, and being neat, clean, and free of air pollution. Similarly, Schneider (2002) found the quality of school buildings related to student behavior, including vandalism, absenteeism, suspensions, disciplinary incidents, violence, and smoking.

Schneider (2002), in his analysis of the research on the affects of school facilities on academic outcomes, concluded that "school facilities affect learning. Spatial configurations, noise, heat, cold, light, and air quality obviously bear on students' and teachers' ability to perform" (p.16).

Another significant contributor to the school climate is school capacity. With U.S. public school enrollment estimated to increase by 6 percent in the next twenty years, the total number of students projected to enroll in U.S. schools increases to 60 million by 2030 (U.S. Department of Education, Office of Public Affairs 2000). As enrollment numbers continue to rise, the issue of school size and small class size become even more important factors for superintendents to consider when improving student achievement. While many schools already have predetermined sizes, superintendents' perceptions of the need for smaller size can lead them to identify ways to create these environments within pre-existing buildings. For example, small schools improved education by creating small learning communities where students were well-known, which reduced isolation, and discrepancies in the achievement gap (Lemasters, 1997). Thus, adequate student capacity becomes an important factor in school environment.

School condition and student achievement

Increased research and studies regarding the condition of U.S. school facilities expand the knowledge of the relation between school facility condition and student achievement. The No Child Left Behind Act of 2001 is the latest federal approach in the improvement of student achievement in U.S. schools. As the national push for increased student academic performance continues, U.S. school facilities continue to deteriorate. While much research exists on the curriculum initiatives that impact teaching and learning, there seems to be a growing body of literature that links school building adequacy and student achievement (Earthman, 2002; Earthman & Lemasters, 1998; Lyons, 2001).

With the challenge of repairing and replacing new schools in an age of educational reform, it proves important to evaluate the impact of their condition on student achievement. A study by Maureen Edwards (1991) in Washington, D.C. found that educational building conditions with poor ratings in relation to their physical condition had lower student achievement performance and estimated that improved facilities could lead to a 5.5% to 11% improvement on standardized tests.

Weinstein (1979) and McGuffey (1982) provided syntheses of 232 studies regarding research on facilities and student achievement, performance, and attitudes. Weinstein (1979) focused primarily on open education programs. She found considerable evidence that the physical environment had an influence on student behaviors. McGuffey (1982) identified two main conclusions as a result of her synthesis: (1) old and obsolete buildings do have a negative effect upon the learning process of students, and (2) safe, modern, and controlled environment facilities enhance the learning process. McGuffey (1982) found that building age; thermal factors, visual factors, color and interior painting, noise control, and building maintenance were all related to student achievement and student attitudes. A follow-up synthesis review by Lemasters (1997) found extensive research on the relation of good facility conditions and student achievement. She reviewed the impact of a school facilities' color, maintenance, age, classroom structure, climate conditions, density, noise, and lighting and the relationship of those on both student achievement and student behavior. Facilities whose condition received higher quality ratings yielded higher student achievement ratings.

Bowers and Burkett (1989) concluded a significant positive relationship between modern, well-maintained facilities and student attitudes. They conducted a study comparing similar populations of secondary students attending school in two different buildings, one built in 1983 and one built in 1939. Their study concluded that the students in the newer building performed higher in reading, language, and mathematics than their counterparts in the older school facility.

Earthman, Cash and Van Berkum (1996) surveyed all the high schools in North Dakota to examine the condition of the school building and the relation to student achievement. Findings indicated that students in above standard school facilities academically outperformed students in substandard facilities, as measured by their scores on the Comprehensive Test of Basic Skills.

Significant research on the impacts of school design on student health, student climate, student achievement and the learning environment now exists (Lemasters, 1997). This body of research continues to grow as the impacts of school design on the education of students continues to be further studied. With billions of dollars at stake for new construction and modernization of U.S. public school facilities, it is important to maximize the sustainability of these buildings, while simultaneously giving consideration to educational changes in the 21st century.

21st Century School Design

Advancement in technology has led to a need for increased change and adaptability in school design within the last fifty years. Increased use of the personal computer and Internet in the latter part of the twentieth century has moved the economy from a base of agriculture and manufacturing to commerce and office work: "These shifts have had enormous impact on the number of everyday life, the economy, and work. Yet despite these changes, our education system remains much the same" (Microsoft Corporation, 2007, p.1). The design of the majority of public schools has not undergone substantial change. If 21st century schools are to adapt to the rapidly changing conditions in the world around them, reinvention of these schools must occur.

Kennedy (2001) identified trends in school design that need consideration in order to meet then needs of the 21st century learner:

1. Alternative school settings, with classrooms meeting at museums or shopping malls.
2. Ecologically friendly schools that incorporate features to conserve energy.
3. Flexible spaces, with classrooms not limited to rows of desks and chairs.
4. Creating outdoor spaces that encourage learning in outside classrooms.

5. Schools viewed as communities with an increase in school pride among staff and students.
6. Smaller schools by creating schools-within-schools.
7. School designs that enhance security and safety of students.
8. School facilities that enhance and support technological advancements.
9. Welcoming the greater community with increased community activities within schools.

Several of these suggestions support maximum use of spaces by suggesting flexibility, using outdoor areas, and providing community access for areas where space is a premium. Addressing these trends when planning the school design process will help school facility planners maximize the investment of the school facility and its impact on student achievement. Kennedy (2001) suggested the need to support and enhance technology. In order to fully prepare the 21st century learner, school design must incorporate a plan for technology advancement.

Planning for technology

With the advancement of technology, traditional methods of instruction are becoming obsolete. Accordingly, new technologies and communication methods will require schools to adapt new instructional delivery methods. Given these changes in technology, Kennedy (2001) stated that "school facilities should not be warehouses where students are deposited for several hours a day" (p.31). Instead, schools should be designed to complement and enhance student learning.

A report prepared for the U.S. Department of Education noted that thirty-five percent of public schools were connected to the Internet in 1994, compared to ninety-nine percent by 2002 (USDE, 2003). Additionally, by the year 2002, the ratio of students to Internet capable computers in public schools dropped to 4.8 students per computer, compared to 12 to 1 in 1998 when first measured (USDE, 2003). This ratio seems low enough for many schools to build and equip shared computer labs or to place a handful of Internet capable computers directly in teacher's classrooms.

According to Cavalier (2002), a fundamental question to ask when planning for technology in school design becomes "What does the institution want to do with or accomplish through technology?" (p.5). Educational planners need to answer questions such as,

> Why do we want to use technology in the first place?
>
> What do we want to accomplish with the technology?
>
> How will we know when we have achieved what we are trying to accomplish?
>
> Does what we are doing with technology align with the mission and vision of the organization? (Cavalier, 2002, p.6).

Answering these questions focused the strategic planning for technology to a level that supports technology uses versus only addressing technology facts, responses centered only on hardware, software, networks, and other technical specifications. Barnett (2001) reported:

> Over the last 20 years, K-12 schools have spent millions of dollars equipping their schools with the latest technologies, but often without a thoughtful plan of

> how their use would impact learning and teaching. Computers like other technologies when they were new … were expected to substantially change education by simply making it more exciting and interactive. But technology use is not about the hardware, internet access and so on. What is important is how the technology is integrated with the instructional program. The guiding question technology leaders must keep in mind as they develop their plan is 'Are students using technology in ways that deepen their understanding of academic content and advance their knowledge of the world around them?' (p.1-2).

When designing school facilities, it becomes important to include a technology plan which addresses the ability of the facility to support the integration of technology into the curriculum. The process involves strategic planning with school officials and architects to develop educational specifications incorporated into the school design which support and enhance technology. And so, the collaboration on the design process must expand from the educational specifications supporting technology use to the conversation regarding how technology is used in the instructional delivery.

Planning for safety

Schools designed for the 21st century must address the safety of students. With an increase in high-profile school shootings, schools are answering the question "How do schools ensure a safe physical environment?" (Schneider, 2007). The No Child Left Behind Act connected school safety to student achievement in the belief "all children need a safe environment in which to learn and achieve" (Schneider, 2007, p. iii).

The physical environment plays a critical role in keeping students safe. The school design should provide an inviting environment in which children can learn, while being protected from threats. Schneider (2007) addressed the concept of Crime Prevention Through Environmental Design (CPTED) which is a critical component of school safety planning when addressing student safety:

> A site that is well protected with natural surveillance, access control, and territoriality will require less staff time and energy to maintain as a safe environment. This leaves instructors more time to focus on teaching, and students more time to focus on learning (p.52).

Schneider (2007) proposed school planners ask the following key questions when addressing school safety through the environmental design of the facility:

1. What risks and opportunities do students encounter between home and school?
2. What risks and opportunities are posed in areas directly adjoining school property?
3. Can office staff observe approaching visitors before they reach the school entry?
4. Do staff members have the physical ability to stop visitors from entering?
5. How well can people see what's going on inside the school?
6. Do staff members have immediate lockdown capability in classrooms and other locations?
7. Is the overall school climate prosocial?

8. Are there identifiable or predictable trouble spots or high-risk locations? (p.7).

A school's physical structure must also provide adequate natural surveillance, natural access control, and territoriality to minimize the need for additional security technologies (Schneider, 2007). These questions prove integral to enhancing the collaboration between superintendents and architects when discussing how the school design will support the safety of students.

Planning for environmental efficiency

Safe schools include both the physical safety of the students and an environmentally safe structure. A recent and rapidly growing trend in school facility design is to construct schools with the specific intent of providing healthy, comfortable and productive learning environments. Often referred to as "green schools", these schools are designed based on the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) specifications. In a report on the cost and benefits of constructing green schools, Kats (2006) provided 17 studies that demonstrate productivity increases of 2% to more than 25% from improved indoor quality, acoustically designed indoor environments, and high-performance lighting systems. Kats (2006) also found that while green schools may be more expensive to build initially (approximately 2% more than conventional schools), the financial benefits of greening schools are about $70 per square foot. The benefits of building a high performance school include lower energy and water costs, improved teacher retention, lower health costs, and lower water and air pollution.

Increased research on the environmental effects of school design in relation to student achievement continues. Included in the research is the effect of the use of natural lighting in the classroom environment. Mahone (1999) conducted a study on the effects of daylighting on human performance. The study analyzed the daylighting condition in over 2,000 classrooms in relation to math and reading test scores of over 21,000 students. When controlling for all other influences, the results of the study found that students with the most daylighting in their classrooms progressed 20% faster on math tests and 26% faster on reading tests in one year than those with the least. The study also concluded that students in classrooms with the largest window areas were found to progress 15% faster in math and 23% faster in reading than those with the least.

The American Society of Heating, Refrigerating and Air-Conditioning Engineers, the American Institute of Architects, the Illuminating Engineering Society of North America, the U.S. Green Building Council, and the U.S. Department of Energy collaborated to write the *Advanced Energy Design Guide for K-12 School Buildings* in order to help designers of elementary, middle, and high school buildings achieve energy savings of at least 30%. The findings in the Guide maintained that the design team can incorporate into building plans energy efficient designs that move a school toward achieving "net zero energy schools – schools that, on an annual basis, draw from outside sources less or equal energy than they generate on site from renewable energy sources" (p.17). Included in the Guide are recommendations for the design of the building envelope; fenestration, lighting systems (including electrical lights and daylighting); heating, ventilation, and air-conditioning systems; building automation and controls; outside air treatment and service water heating (American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc., et al., 2008).

Overall recommendations

The American Architectural Foundation and Knowledge Works Foundation partnered to host the National Summit on School Design. With advances in technology, educational theory, and an increased understanding of how students learn, the foundations convened the National Summit on School Design as an opportunity for new ideas to surface regarding what schools can and should be (American Architectural Foundation, 2006). The American Architectural Foundation believed a well-designed school should include the following key principles: (1) support teaching and learning, (2) be safe and healthy, (3) be sustainable, clean and green, (4) be a center of community, (5) be based on a public process, and (6) be practical, cost effective and flexible (American Architectural Foundation, 2006). These key principles can guide the collaboration between superintendents and architects when designing a school facility.

A report from the National Summit on School Design included eight overall recommendations were made to school design for the 21st century:

1. Design schools to support a variety of learning styles.
2. Enhance learning by integrating technology.
3. Foster a "small school" culture.

4. Support neighborhood schools.
5. Create schools as centers of community.
6. Engage the public in the planning process.
7. Make healthy, comfortable, and flexible learning spaces.
8. Consider non-traditional options for school facilities and classrooms. (American Architectural Foundation, 2006).

These recommendations become essential components for guiding the collaboration between superintendents and architects when planning the school design.

Incorporating flexibility, adaptability, and collaboration will prove essential to the design of 21st century schools. Future societal trends will have a direct impact on school planning. Changes in societal beliefs about how and where students will learn, technological advances, and curriculum initiatives have direct impacts on school facilities. Stevenson (2006) believed that "how school facilities can best support the education of students in the coming ten to twenty years is wholly dependent of what the educational programs will be" (p.14). Major contributors impacting school design for the 21st century involve how the country decides to educate students and finance the support of education. Stevenson (2006) noted an increased need to create schools that serve as neighborhood centers in order to generate public funds to support new construction and renovations from a growing aging population. He further stated that "encouraging dialogue across all segments of the greater community is essential to defining education and assuring, then, that facilities reflect and support it" (Stevenson, 2006, p.14). The design of school facilities to support student learning, while maximizing the use of public funds and increasing accessibility to the community are integral components of the collaboration of superintendents and architects within the school design process.

Future-Based Visioning through Collaboration

The original rationale for the creation of The American School and University handbook in 1928, which was written as an authoritative reference handbook about planning, design, construction and operation of educational facilities stated

> To all those who are responsible for enlarging and maintaining America's educational facilities comes the occasional need for new plant and equipment, and the constant need for efficiency in the use and upkeep of existing buildings and ground" (Kennedy, 2003, p. 23).

Paralleling present-day themes, the 1928 handbook addressed inadequate school facilities, class size, overcrowded facilities, and addressing future needs in facility planning (Kennedy, 2003). A 1935 article in the same publication stated that "Even today many classrooms are being planned where the only criteria used in guiding the planner are the number of square feet per pupil. Here and there, however, one finds the pioneer superintendent and architect who are thinking in terms of better adaption of classroom space to the needs of the educational program" (Kennedy, 2003, p.24). As we look to the future of designing 21st century schools, educational leaders and architects need to collaborate to design schools that will allow for flexibility and maximum potential of fiscal resources to educate children.

"Schools built today must be designed to not only meet the needs of today's students, but of multiple future generations of students that will live and learn in a constantly and rapidly changing world" (Fisch, 2008). Therefore, superintendents and architects must work together to design schools that learn (Senge, 2000; Fisch, 2008). Senge (2000) defined schools as learning organizations, where people "marry their aspirations with better performance … [which also includes]… breakthroughs of the mind and heart" (p.5). This "marriage" adopts a "systems thinking" approach, with developed awareness of the interdependence within school organizations. Hoy & Miskel (2005) recognized the importance of schools as learning organizations and provided a complimentary definition which stated that "the participants pursue common purposes with a collective commitment to routinely assessing value of those purposes, modifying them when appropriate, and continually developing more effective and efficient ways to achieve those purposes"(p.33). In order to see the school as a learning organization, individuals must recognize that every organization is a product of how its members think and interact, and learning must be seen as a connection that is driven by vision.

As educators and architects collaborate to plan for designing schools of the future, Stevenson (2001) identified several questions that must be considered:

1. Who will attend the schools?
2. Where will the schools be located?
3. How large will the schools be?
4. What role will technology play?
5. What role will school facilities play within their communities?

6. What spaces will schools of the future include?
7. What will be the instructional materials of schools?

Stevenson (2001) believed that schools built today should be designed with the future in mind. These key questions are essential to the collaboration between superintendents and architects when programming a new school.

At the inception of the design process, a more systemic method of collaboration must occur to link future educational trends with the sustainability of the school facility. Traditional methods of strategic planning must be replaced with future-based planning methods based on theories from systems thinking (Mylen, 2002). Within this process of planning, all of the stakeholders in the system must gather to create and analyze data. By including all the stakeholders (administrators, teachers, support staff, students, parents, and community members), a diverse group begins to take responsibility for identifying, responding to, and influencing the changes in the environment. Future-based planning maintains that an organization's change effort will get more implementation when the people involved attend to each state of the process, have ample opportunity to engage each other, create an umbrella of shared values, commit to action steps they believe in, and get together regularly to share what they are doing" (Weisbord and Janoff, 1995, 51).

Within the school design process, collaboration for school design will incorporate all the stakeholders involved. School facility design committees should be representative of many groups, including administrators, teachers, business and community members, parents and students. The group should be empowered to review data, investigate options, and make recommendations (Bingler et al., 2002). According to Henry Sanoff (2003), a school architect, “When students, parents, administrators, and other community members talk and listen to each other, they gain a deeper understanding of the challenges facing education and how to meet them” (p.1). The inclusion of all the stakeholders enhances the design process by creating input from varied resources.

Lackney (2008) discusses educational commissioning as a concept for optimally using a school facility for teaching and learning. Educational commissioning is “a process through which teachers, students and even parents and community partners are educated as to the design intent of a newly constructed school facility” (Lackney, 2008, p.1) The process begins before the pre-design of the building and essentially serves as an action and training plan for teachers to use the school building as a three-dimensional textbook. Through this process, teachers are taught to maximize their school facility for teaching and learning. Stakeholders are educated on the intent behind the design of their school in order to optimize the full potential of the building for learning.

When applying a systems-thinking approach to school design, Nair (2003) called for a shift in thinking about the school building as a product, but instead viewing effective learning environments as a process. The word “process” is applicable to schools because it is the process used to develop the school and the process of learning that the environment must support (Nair, 2003). Therefore, a good process involves as many stakeholders as possible during the early conceptual and planning stages of the school. Nair (2003) defined the purpose of the school development process:

> to shift the focus away from the building and toward the goals for the facility – to support the learning modalities of the 21st century, to serve as a center of community, to strengthen links between education and business sectors, to provide a forum for continuing education, to support research, to partner with higher education institutions and so on. 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.3).

Collaboration becomes an essential component in redefining the emphasis added by which schools are designed and planned.

To enhance collaboration, the National Summit on School Design proposes that engaging the public in the planning process becomes essential to building an effective school for the 21st century (American Architectural Foundation, 2006). The process for engaging the public must begin early, allow for community input before final decisions are made, include all school and community stakeholders, and recognize minority opinions. A visioning process is recommended where stakeholders can provide input about the role of the school in educating students and serving the community (American Architectural Foundation, 2006).

The focus on the processes involved in school design provides a quality management approach to the design. Quality management requires a management of the system and the variation within the system. Adapting a systemic approach to school design, taking into account the principles guiding quality management, is essential to building sustainable 21st century schools. Bonstingl (1992) identifies four pillars of quality schools: customer-supplier focus, dedication to continuous improvement, process/systems approach, and management's constant dedication to total quality. Based on Bonstingl's work, the key components of a total quality management system are: leadership, customer needs, quality of design, and employee involvement.

Total quality management differs from traditional management in that quality management exchanges the quick-fix approach for a new management philosophy that has a structured, disciplined operating methodology to one that stresses long-term continuous improvement. Through a quality management approach, decisions on fact focus on customer satisfaction and a relation to the aim. With a quality management approach, school design yields better sustainable results.

CHAPTER III

METHODOLOGY

The purpose of this study was to examine superintendents' and school architects' perceptions of their respective contributions to and areas to strengthen within the design process as it relates to designing a school facility that supports student learning. I made an effort to determine those areas where an increase in the knowledge base of superintendents and architects would result in a more effective collaboration in the school design process.

Within the broad purpose of determining the contributions made by superintendents and architects respectively when collaborating to program a new school, these are the specific research questions answered:

1. What information do superintendents and architects need to provide to their counterparts when planning the school design?
2. What information do superintendents and architects need from their counterparts to help them make decisions when planning the school design?
3. What do superintendents and architects expect to see included in a school that supports student learning?
4. What do superintendents and architects expect to see included in a school that supports student safety?
5. Who should be involved in the planning process?

6. Where do superintendents obtain knowledge on how to collaborate with architects when designing a school?

In this chapter the methodology used in the present study is described, including the research design, identification and selection criteria, data collection procedures, data analysis, validity and reliability considerations, and limitations of the study.

Research Design

The method of research chosen for this study was survey research. Survey questionnaires are an effective method of collecting information about a sample's experiences, opinions, and characteristics. The findings from survey questionnaires can then be generalized to the larger population that the sample represents (Gall, Gall, & Borg, 2005). In this particular study, survey questionnaires were used to elicit data on the contributions that superintendents and architects make respectively when collaborating on the design process for a school facility focused on student learning and their input on areas to strengthen within the collaboration. The surveys used in this proposal are found in Appendices A and B.

The qualitative nature of the information sought makes it necessary to use open-form questions on the primary survey instrument. Therefore, I asked superintendents and architects to reply to questions on their contributions when collaborating on the school design process in order to gain knowledge and insight of the collaborative process. This approach is based on the understanding that knowledge exists within the perspectives and experiences of people, and is obtained by understanding the meaning inside those experiences (Merriam, 1991).

Qualitative research assumes that there are multiple, subjective, and changing realities, which "exist in the form of multiple mental constructions, socially and experientially based, local and specific, dependent for their form and content on the person who holds them" (Guba, 1990, p. 27). Within qualitative research, these multiple realities are related to each other and work together as a whole. By surveying superintendents and architects using a qualitative methodology, I was able to obtain multiple individual realities that could be analyzed to create a picture of the collaboration process of the group as a whole. According to Lincoln and Guba (1985), the use of qualitative data "increases the scope or range of data exposed … as well as the likelihood that the full array of multiple realities will be uncovered" (p. 15). Therefore, I coded responses to the survey through a qualitative analysis procedure which are explained later in this chapter. Using interpretive qualitative analysis allowed me to best meet the goal of the research project.

Identification and Selection Criteria

Creswell (2002) defines a population as "a group of individuals that possess the same characteristics, as a large group of individuals" (pp. 162-163). The population chosen for this study was Texas superintendents and Texas school architects, both with experience in planning new schools.

Superintendent population selection

The Texas Education Agency provided a listing of contact information for all school superintendents in Texas registered with the AskTED directory system. I was able to directly contact 475 Texas school superintendents, who had registered their email address. The key selection criterions for the superintendents included:

1. Certified Texas superintendent, and
2. Current superintendent of a Texas public school district.

The rationale for choosing certified Texas public school superintendents as participants for this research is based on the assumption that they will have a significant leadership role in the process of planning the design of a school facility as well as a more reasonable knowledge base on the building's impact on student achievement due to their responsibilities as a long-term planner and reviewer of all a district's campus data.

Architect population selection

The Council of Educational Facility Planners, International (CEFPI) provided a directory listing of CEFPI member architects. I was able to contact 104 architects. The key selection criterions for the architects included:

1. Certified architect, and
2. Membership in the Council of Educational Facility Planners, International (CEFPI).

I selected architects with experience in planning school facilities as participants for this research based on their experience in planning facilities specific to the school plant.

CEFPI's sole mission is improving the places where children learn. My rationale for the selection criterion of membership in CEFPI was based on the assumption that architects who have a membership in CEFPI will share in it's mission and have a focus on planning quality school facilities.

Participant selection

In addition to selecting a population for this research study, a sample representation of the population was selected using nonprobability sampling. Creswell (2002) stated that the researcher must set criteria for the selection of a sample from the population. When setting the criteria for the sampling, "researchers intentionally select individuals and sites to learn or understand the central phenomenon" (p.194). McMillan and Schumacher (2006) stated that when identifying the sample, nonprobability sampling may be used: "Nonprobability sampling does not include any type of random selection from the population, rather the researcher uses subjects …who may represent certain types of characteristics" (McMillan and Schumacher, 2006, p.125).

According to McMillan and Schumacher (2006), purposeful sampling is utilized when the researcher:

> selects particular elements from the population that are representative or informative about the topic of interest. On the basis of the researcher's knowledge of a population, a judgment is made about which subjects should be selected to provide the best information to address the purpose of the research (p.126).

The criterion for this purposeful sample was that the Texas public school superintendents and Texas architects must have experience in designing a new school facility. Of the 183 responding superintendents, 94 met the criteria for the sample selection. As for the architects, all 46 respondents met the criteria.

Participant description

I surveyed 475 Texas school superintendents at the email address they registered in Texas Education Agency's AskTED directory system. A total of 183 superintendents returned the survey, representing a 38.5% response rate. I surveyed 104 architects using the electronic directory listing for CEFPI. A total of 46, or 44.2%, of the architects returned the survey. From this population, responses were sorted based on criteria of experience in designing a school. Of the 183 superintendents who responded to the survey, 94 met the selection criteria of having designed more than one school. As for the architects, all 46 respondents met the criteria.

While participants were selected for the study based on having designed at least one school, the number of schools actually designed by superintendents and architects varied. Table 1 illustrates the number of schools designed by participants in the study.

TABLE 1. Number of Schools Designed by Study Population

Number of Schools Designed	# of Superintendents (% of population)	# of Architects (% of population)
1	29 (30.9%)	
2-5	54 (57.4%)	3 (6.5%)
6-10	7 (7.4%)	5 (10.9%)
11-15	3 (3.2%)	3 (6.5%)
16+	1 (1.1%)	35 (76.1%)

The majority of superintendents (88.3%) have designed between 1 and 5 schools while the majority of architects (76.1%) have designed more than 16 schools. Given that the primary role of architects is to design school facilities, the number of school facilities they have designed are significantly higher than those designed by a superintendent. A superintendent becomes involved in a building program only if he or she is employed by a district with facility needs and a community willing to fulfill those needs by passing a bond issue. However, a superintendent brings with their experience the knowledge of how learning occurs in the school.

Superintendents participating in the study were in districts ranging from fewer than 500 students (22.3%) to over 5,000 students (19.1%). The majority of superintendents participating in the study were in mid-size districts with 1,000-4,999 students (39.4%).

Superintendents and architects were also asked to provide their number of years experience in their respective positions. Fifty-five of the superintendents (58.6%) have been in the superintendency position for 10 years or less while thirty-four of the architects (73.9%) have been in their position for over 16 years. Table 2 shows the years of experience of the participants in their specific position.

TABLE 2. Years of Experience of Study Population

Years of Experience	# of Superintendents (% of population)	# of Architects (% of population)
1	7 (7.4%)	
2-5	26 (27.7%)	
6-10	29 (30.9%)	5 (10.9%)
11-15	20 (21.3%)	7 (15.2%)
16+	12 (12.8%)	34 (73.9%)

There is a significant difference in the years of experience between superintendents and architects; however, it is important to note that while the years as a superintendent are less than those of an architect, a superintendent is the chief executive officer or a school district. In general, superintendents will have spent many years in the field of education prior to assuming their role as the top executive. With this in mind, the level of experience in education is greater for superintendents than indicated in their years of experience at the superintendency level. It is not until they reach the top position, however, that an educator would assume responsibility for communicating with an architect on the design of a school.

Data Collection

Instrumentation

The primary instrument used to collect data was an electronic survey, distributed to superintendents through e-mail using TEA's database and to architects through the Council of Educational Facility Planners, International's (CEFPI's) electronic distribution list. I constructed the survey following the seven steps of Gall et al. (2007): (1) defining objectives, (2) selecting a sample, (3) writing items, (4) constructing the questionnaire, (5) pretesting, (6) preparing a letter of transmittal, and (7) sending out the questionnaire and follow-ups. I pre-tested the survey instrument with a pilot group, consisting of three architects and three superintendents in order to check for clarification and understanding of the survey.

Pilot testing of the survey. Prior to mass distribution, I piloted the survey by administering it to three volunteer superintendents and three architects who met the requirements of the sample selection. The pilot surveys took approximately 30 minutes to complete and were done electronically. A personal phone conversation followed-up the submission of the electronic survey to discuss suggestions. Input from these telephone conversations led to the final draft of the survey instrument.

Data collection activities

I inserted the survey instrument into electronic software, Survey Monkey, and administered it to the sample population. Dillman (2007) recommends following these steps in order to maximize the response rate:

- Utilize a multiple contact strategy much like that used for regular mail surveys.
- Personalize all email contacts so that none are part of a mass mailing that reveals either multiple recipient addresses or a list serve origin.
- Keep the cover letter brief to enable respondents to get to the first question without having to scroll down the page.
- Inform respondents of alternate ways to respond, such as printing and sending back their response (pp. 367-369).

The study followed the above recommendations. I made initial direct e-mail contact with all Texas superintendents using the AskTED distribution list and with architects using the CEFPI distribution list to identify the purposeful sample. I accomplished this via a personal electronic mailing inviting them to participate in the study (Appendix B.) The electronic mailing identified that the participants acknowledged their voluntary participation in the survey when they requested access to the web page containing the survey. As a result of this process, the introductory email (Appendix B) along with instructions to access the electronic survey was sent to 475 superintendents and 104 architects. One hundred and eighty-three of the superintendents (38.5 %) and forty-six of the architects (44.2%) responded to the survey, which concurred with Dillman's (2007) reported 42% average response rate for electronic surveys. All 183 of the superintendent respondents returned the survey electronically. Of the 46 architect respondents, 19 returned a paper copy of the survey. The responses from the paper copies were manually entered into the survey software by the researcher.

I followed the initial distribution of the survey in two weeks with a second request sent to those who did not respond to the first request. Survey Monkey, the instrument used in this record of study allows the researcher to send requests only to the non-respondents. I sent a third request two weeks after the second request. I sent an e-mail to superintendents and architects which included a hyperlink that allowed participants to access the survey directly. Appendix A contains the survey that I distributed to participants.

Data Analysis

Data analysis is the process of searching and arranging data within interview transcripts, field notes, and other materials to obtain findings (Bogdan & Biklen, 2007).

According to Lincoln and Guba (1985), “Data analysis involves taking constructions gathered from the context and reconstructing them into meaningful wholes” (p.333). Data analysis involves organizing the data into meaningful units, coding them, synthesizing them, and searching for patterns. I used the narrative analysis and case study applications as outlined by qualitative researchers Merriam (2002), Bogdan and Biklen (2007), and Gall et al. (2005). I organized the data from the superintendents’ and architects’ surveys and coded into similar categories. I then examined these categories to determine patterns, identify inconsistencies, and note descriptive examples. I analyzed the responses from superintendents and architects individually, and as they compared to each other. Through this analysis, themes emerged from these responses. While there are multiple ways to analyze data, the analysis in this study adopted the basic interpretive qualitative study method.

Basic interpretive qualitative study

In qualitative research, a central characteristic is that individuals construct reality in interaction with their social worlds (Merriam, 2002). Researchers conducting a basic interpretive qualitative study research how people interpret their experiences, construct their worlds, and attribute meaning to their experiences. Within this study, I coded and recoded data according to the constant comparative method.

The constant comparative method uses an analysis process involving “comparing one segment of data with another to determine similarities and differences” (Merriam, 1998, p.18). Constant comparative analysis methodology aids in “identifying patterns, coding data, and categorizing findings" (Anfara, Brown, and Mangione, 2002). The three main steps in analysis used in this method were: opening coding, forming categories, and formulating patterns:

Opening coding. The process of opening coding uses terms to label meaningful segments of text. Therefore, I reviewed units of data. Using this coding process, the data for each survey question, I coded and gave labels to the meaningful segments of text.

Formulating categories. The second step of constant comparative analysis was to formulate categories. The initial codes related to same topics from the opening coding process were grouped and further formed into a set of categories. I analyzed the units of data to "develop categories rather than to simply label topics" (Charmaz, 1988, p.116). I then analyzed the data and "compared within categories and between categories" (Anfara, Brown, and Mangione, 2002).

Formulating patterns. The final step in the data analysis involved identifying relationships between categories to formulate patterns, and make meaning of these patterns. After forming different categories, I analyzed the data to determine their relationships. From these relationships, themes emerged.

Identifying participants

In order to provide the reader with contextual information related to the responses, while maintaining an individual's anonymity, I used the following coding system to identify participant responses. Each participant was assigned an individual code to identify their role as either a superintendent or an architect and their experience level based on the number of buildings they have designed. Each code consisted of 4 units of data. Table 3 identifies the coding structure.

TABLE 3. Descriptive Coding Structure for Participants

Unit	Descriptive code
1	S for superintendent, A for architect
2	Number of buildings designed
3	S for superintendent, A for architect
4	Individual number 1-94

Based on this coding system, a superintendent who has designed 2-5 years schools might be assigned the code S2-5S4, while an architect with experiencing designing more than 16 schools would have a code such as A16A23.

Validity and Reliability

When designing a study, ensuring the trustworthiness of research proves essential. Otherwise, there is little reason for readers to accept the findings or results of the research. Conventionally, researchers use internal validity, external validity, reliability, and ethical conduct as the criteria to justify the trustworthiness of a study (Merriam, 2002). The following paragraphs address each of these requirements.

Internal validity

Internal validity addresses the issue of how congruent the findings are to reality (Merriam, 2002). The study established trustworthiness through internal validity by the use of multiple and different sources of data. Denzin (1978) addressed this method of establishing internal validity. The superintendents were of different ages, different school districts, and different areas of the state. The architects were also of different ages, from different architectural firms, and were based in different areas of the state.

External validity

External validity or generalizability in qualitative research concerns "the extent to which the findings of a particular inquiry have applicability in other contexts or with other subjects" (Lincoln and Guba, 1985). Qualitative research's generalizability is dependent on the readers finding insights from the study that may inform their own understanding of events (Lincoln and Guba, 1985; Merriam, 2002). Since the responsibility for determining generalizability lies with the reader, I provided adequate information to help the reader make this judgment. Merriam (2002) suggests that qualitative researchers should provide rich, thick descriptions in the study. This involves an adequate database, which includes enough description and information about the individuals or programs being researched to allow readers to determine how closely their situations match, and the use of multisite designs in the studies to provide diversity in the nature of the sites selected (Merriam, 2002). I provided a rich and thick description about the participants, the findings and conclusions, the process, and the context of this study. A detailed description of the participants experience in their position as well as number of buildings designed was provided. Participant responses were also coded using this information to provide a richer description of the information. The participants varied in both age and location, thus creating a greater ability to match with the reader's situation.

Reliability

Reliability refers to "the extent to which research findings can be replicated" (Merriam, 2002, p.27). In qualitative research, reliability is concerned with whether the results are consistent with the data collected (Merriam, 2002). Within these concepts, reliability "lies in others concurring that given the data collected, the results make sense, i.e. that they are consistent and dependable (Merriam, 2002). For this study, I used an audit trail to support the reliability of the research findings. Table C contains the responses from the superintendents and architects used in the data analysis.

Ethical Issues

I addressed the study's ethical considerations by strict adherence to the research policy and procedures through the Human Subjects' Protection Program and the Institutional Review Board at Texas A&M University. I connected with participants through an electronic mail survey. Each participant in the study was sent an introductory e-mail with a cover letter explaining the study and requesting their voluntary participation (Appendix B). The cover letter described the purpose of the study. Strict attention to participants' rights and confidentiality were detailed in the informed consent communication provided to all participants.

I kept all data in secure files to which only I had access during the course of the study. I will keep the data collected and the results for a period of five years, according to the American Psychology Association (2001) statement:

> Authors are expected to retain raw data for a minimum of five years after publication of the research … other information related to the research (e.g., instructions, treatment manuals, software, and details of procedures) should be kept for the same period of time (p.354).

After the five-year period, I will destroy all surveys and demographic information.

This chapter provided a comprehensive explanation of the research procedures, including the identification and selection of the participants, creation of the survey and methodology used for the study. Chapter 4 provides the analysis of the data.

CHAPTER IV

ANALYSIS OF DATA

The purpose of this study was to identify areas of knowledge needed by superintendents and architects to enhance their collaboration in the school design process. Understanding the contributions of the people who influence school design helps identify areas of knowledge needed to enhance the collaboration process. Determining these areas would result in a more effective collaboration between superintendents and architects in the school design process.

I surveyed 475 Texas school superintendents at the email addresses they registered in Texas Education Agency's AskTED directory system. A total of 183 superintendents returned the survey, representing a 38.5% response rate. I surveyed 104 architects using the electronic directory listing for CEFPI. A total of 46, or 44.2%, of the architects returned the survey. From this population, responses were sorted based on criteria of experience in designing at least one school. Of the 183 superintendents, 94 met the criteria for inclusion in the analysis. Forty-six architects met the criteria of having built at least one school.

When collecting responses from superintendents and architects, I asked questions about what information needs to be conveyed from one group to another, as well as what information each group needs. Eighty-three of the superintendents (88%) wrote with responses that tended to be in a format consistent with the listing of thoughts and one or two word answers. On the contrary, twenty-two of the responses from architects (48%) tended to be in sentence or paragraph format., thus providing a more thorough response to the question.

According to Lincoln and Guba (1985), "Data analysis involves taking constructions gathered from the context and reconstructing them into meaningful wholes" (p.333). Responses from superintendents and architects were coded into meaningful units of data. These units were separated into categories, which were further developed into themes.

In order to develop meaning for the myself and the reader, I organized my data into these emerging themes, which I have identified as the areas of knowledge needed to enhance the collaboration. These areas of knowledge came out of the first three research questions, which focused on the conversation between superintendents and architects when designing a school. The responses from the first three research questions analyzed were:

1. What information do superintendents and architects need to provide to their counterparts when planning the school design?
2. What information do superintendents and architects need from their counterparts to help them make decisions when planning the school design?
3. What do superintendents and architects expect to see included in a school that supports student learning?

The responses to each of these questions were analyzed separately for each question to form categories and then grouped together to form themes. The themes which emerged became the areas of knowledge for the collaboration between superintendents and architects. These areas of knowledge were: budget, school capacity, technology, superintendent as communicator, design trends, curriculum programming, and school climate. Table 4 illustrates the number of responses from superintendents and architects referencing each of the emerging areas of knowledge when collaborating to design a school.

TABLE 4. Number of Responses In Each Area of Knowledge

Area of Knowledge (Theme)	# of Superintendents' Reponses (% of superintendents)	# of Architects' Responses (% of architects)
Budget	71 (76%)	33 (72%)
School capacity	60 (64%)	17 (37%)
Technology	56 (60%)	18 (39%)
Superintendent as communicator	47 (50%)	20 (43%)
Design trends	42 (45%)	33 (72%)
Curriculum programming	37 (39%)	27 (59%)
School climate	33 (35%)	18 (39%)

The interpretations of these themes yielded the following findings included in this chapter. The themes are discussed according to the rank order of importance based on the number of responses from superintendents. In addition to addressing the aforementioned themes, analysis of the responses of each of the other research questions focused on 1) addressing safety, 2) who should be involved in the planning process and 3) the ability of the superintendency certification program to prepare superintendents for the school design process are also presented.

Budget

A study by the National Education Association (2000), the estimate of funds needed to modernize schools is approximately $322 billion. Taking into account factors such as current student enrollment, enrollment growth trends, age and condition of school facilities and regional cost factors, Crampton and Thompson (2002) analyzed the funding needs for school infrastructure across the United States and found the total costs to be approximately $266 billion. According to their analysis, Texas ranked fifth in the nation in 2000 in the number of dollars needed to bring school infrastructure to an acceptable condition. California, New Jersey, New York, Ohio, and Texas accounted for almost 50% of the entire funding needed across the nation for school infrastructure.

Despite the federal No Child Left Behind Act’s major objective to boost the performance of all students, no large-scale relief funds have been allocated to support school districts’ need for school facilities. Historically, local school districts have been responsible for funding school construction expenditures. Local funding for school construction comes mainly from voter-approved bond issues and property tax revenues.

The expenditures for new school construction are approved and monitored outside of the district's operating budget. Thus, the responsibility of efficiently using these taxpayer dollars lies with the superintendent and school board.

With billions of dollars of federal, state, and local funds needed to build and repair school facilities coupled with a national push for high student achievement, and the responsibility of good stewardship of these dollars, every fiscal resource must be maximized to ensure funds are used to support student achievement. With the majority of the fiscal resources coming from taxpayer funds, the importance of a school construction budget resonates with superintendents.

Superintendent's perspective

Seventy-one of the superintendents (76%) included budget and cost information in their responses to questions on the collaboration of the school design process. Table C-1 contains these responses. Thirty-eight of the superintendents (40%) felt it was important to provide architects with budget guidelines as a primary piece of information when designing the school. As one superintendent wrote,

> Start architect involvement when bond issue is being planned. Let them know exactly how much money you have to spend and that you want to get the most out of every penny spent (S2-5S48).

Another superintendent said the scope of the budget is the sole determinate of the design of a school project when writing,

> Money!!!! Sadly, that is what determines a project. I wish I could say it is the kids but money drives it all (S1S75).

Budget information superintendents must provide to architects included:

- "[available] budget" (S1S82, S1S84, S1S86, S1S89, S2-5S14, S2-5S20, S2-5S24, S2-5S29, S2-5S40, S2-5S51, S2-5S54, S2-5S57, S2-5S60, S11-15S1, S11-15S3, S16S66, S16S67),
- "budget limitations" or "financial constraints" (S1S88, S2-5S33, S2-5S37, S2-5S44, S2-5S64, S16S69), and
- "stewardship of tax dollars" (S2-5S18).

In addition to communicating the budget to architects, fifty-five (59%) superintendents wrote that they needed cost information from architects in the planning of school projects. Superintendents wrote that they needed architects to provide them with information on cost efficiency of schools and designing schools that would support long-term savings. Responses from superintendents included needing information from architects about:

- cost estimates (S1S70, S1S77, S1S80, S2-5S16, S2-5S23, S2-5S27, S2-5S30, S2-5S39, S2-5S41, S2-5S59, S6-10S9, S11-15S1, S11-15S3),
- cost effective solutions (S1S78, S1S93, S2-5S11, S2-5S26, S6-10S6, S6-10S8, S16S69),
- cost variation of different building designs (S1S70, S1S74, S1S85, S2-5S18, S2-5S22, S2-5S42, S6-10S6),

- square footage costs (S1S82, S2-5S33, S2-5S46, S2-5S47, S2-5S49, S2-5S54, S6-10S9), and
- cost saving materials (S2-5S50, S2-5S63, S11-15S2, S16S65).

One superintendent responded that information from architects needed to include:

> The cost option of different products and their longevity. The cost to operate the facility and future savings or replacement costs and prove the research and results are good" (S2-5S42).

When referencing the budget, superintendent responses included needing information and assistance with cost estimates and efficiency. One superintendent responded with needing to ask the architect:

> How much of what I want and need can I get for the dollars I have available? How should I prioritize my needs and wants? What is new, efficient and cost effective for schools that I may not have been aware of? Most importantly, I depend on the architect to make me aware of questions that need answers that I would not have otherwise had knowledge of (S1S93).

Based on the majority (76%) of responses referencing budget and cost information, this is the primary piece of information superintendents felt they needed to share with architects or receive information from when collaborating on school design.

Architect's perspective

Thirty-three of the architects' responses (72%) were related to budget and bond election amount to support the costs of the design project.

> We [architects] design schools in huge districts and small so we get various input from superintendents. We need solid budgets (A16A1).

Information regarding "financial challenges" for the district was also indicated as helpful to architects. Other responses from architects indicated needing information from superintendents regarding:

- budget (A6-10A43, A11-15A44, A16A3, A16A7, A16A12, A16A25, A16A32, A16A34),
- schedule of the project (A11-15A44, A16A3, A16A4, A16A7, A16A19, A16A34),
- scope of the project (A6-10A43,A16A19, A16A34), and
- bonding capacity (A16A9, A16A31).

Knowing this information from superintendents assists the architects in designing the school. Similar to superintendents' responses, architects also need to converse with superintedents on the topic of budget. Table C-1 includes all the responses from architects referencing budget.

Twenty-six (57%) architects also indicated that they must often communicate cost information to superintendents. Architects' responses about information they must communicate to superintendents included:

- current building / construction costs (A16A13, A16A14, A16A20, A16A21, A16A33),
- cost trends (A6-10A42, A16A14, A16A16, A16A32),
- ways to save money and time (A16A14, A16A20, A16A21), and

- costs per square foot (A16A4, A11-15A45, A16A33).

Current trends in construction costs in the design of the school are essential to share with superintendents. When referencing cost estimates, architects associated the importance of developing a "scope of the project" in order to relate with the district's budget, as well as the impact of change orders and design elements on the overall costs. Architects responded with the need to convey: "estimated costs," "realistic schedule," and "ways to save money and time." As one architect wrote,

> [We] recommend construction methods and materials commensurate with the budget (A16A20).

Summary

With NEA's (2000) estimated $322 billion dollars needed to repair and modernize U.S. schools, it is expected that the topic of budget would resonate with superintendents and architects when designing a school. Given that Texas is 5th in the nation when it comes to the amount of funding needed to address construction needs, this topic specifically ranks high in this state (Crampton & Thompson, 2002).

Seventy-one of the superintendents (76%) and thirty-three of the architects (72%) included budget and cost information in their responses when collaborating on the design of a school. Within the topic of finances, both groups focused on similar categories involving communicating the budget and cost limitations, scope of the budget, cost estimates and building designs to save on costs.

The majority of funding for school construction is approved through local school bond elections and monitored outside of the school district's operating budget. Given the fiscal responsibility that is placed on superintendents to monitor this funding, the burden of ensuring good stewardship of taxpayer's dollars is present. Superintendents' responses addressed this responsibility as important to consider when designing a school. The duty superintendents feel to efficiently monitor funds explains why budget was important in over three-fourths of the superintendents. Those superintendents not mentioning budget focused on school capacity and design trends as the main topic of their conversations with architects.

Further analysis of the responses addressing budget yielded an interrelatedness between what superintendents need architects to communicate and what architects communicate, as well as what architects need superintendents to communicate and what superintendents communicate. This interrelatedness between what one group needs from the other and what is communicated is positive when addressing the topic of budget in the school design process.

School Capacity

The U.S. Department of Education (2000) estimates the number of school children attending public schools will increase to 60 million by 2030. With these enrollment increases, the National Education Agency (2000) established a figure of $322 billion to modernize U.S. schools with new facilities or needed repairs. In districts with a fast-growing population, the rate of growth of student enrollment coupled with the financial burden to address inadequate facilities can overwhelm a district's ability to predict and plan for designing and building schools. Despite these challenges, communities expect schools to be built for long-term use. Therefore, when designing a school facility, school capacity becomes an important topic within the collaboration between superintendents and architects. School capacity is defined as the number of students a school can hold without overcrowding. Discussion centered on school capacity was similar among both superintendents and architects. Within this discussion, responses related to the current or projected number of teachers, students, classrooms, or amount of space needed were considered.

Superintendent's perspective

Of the 94 superintendents who met the criteria for inclusion in the analysis, 60 (64%) indicated that the desired school capacity of the building was important information to collaborate on with architects when designing a school. These responses can be found in Table C-2. After analyzing the superintendent responses related to capacity, the following areas were identified:

- amount of space needed / room size (S11-15S3, S1S67, S1S70, S1S73, S1S77, S1S89, S2-5S11, S2-5S15, S2-5S18, S2-5S22, S2-5S24, S2-5S27, S2-5S32, S2-5S34, S2-5S38, S2-5S47, S2-5S56, S6-10S8),

- number of students (S11-15S1, S1S70, S1S82, S1S86, S2-5S13, S2-5S23, S2-5S26, S2-5S28, S2-5S32, S2-5S49, S2-5S53, S2-5S60, S2-5S61, S2-5S63),
- ages / grades of students (S11-15S1, S1S94, S2-5S11, S2-5S15, S2-5S16, S2-5S23, S2-5S26, S2-5S36, S2-5S46, S2-5S55, S2-5S60),
- future enrollment projections (S1S72, S1S77, S1S89, S1S90, S2-5S17, S2-5S24, S2-5S45, S2-5S47, S2-5S61, S2-5S63),
- adequate space in relation to technology (S11-15S2, S11-15S3, S2-5S18, S2-5S32, S2-5S47, S2-5S53, S2-5S56, S2-5S63, S2-5S64),
- number of classrooms (S1S92, S2-5S13, S2-5S26, S5-10S10),
- type of classrooms (S11-15S2, S2-5S17, S2-5S53, S2-5S56), and
- number of teachers (S11-15S1, S2-5S53).

Future enrollment was a key concept when referring to school capacity. Future enrollment helps to address the amount of space needed, number of students and number of classrooms when addressing school capacity. In addition, future enrollment projections help a district address grade configurations when analyzing school capacity across all campuses. As one superintendent indicated,

> Enrollment projections and planned programs for the school are musts. New schools must be able to provide the needed spaces for the instructional programs that will be provided at the campus. The school must not have portable buildings after it is opened (S2-5S17).

Superintendent responses were concerned with the logistics of school capacity – number of rooms, number of teachers, and number of students. They were clear in stating that school capacity to meet both current and future needs was a key component of the information they must convey to architects. Superintendents included the topic of school capacity when answering questions about information they provide to architects and need from architects when designing a school.

Architect's perspective

Seventeen (37%) architects wrote that school capacity information was important when guiding the school design process. These responses can be found in Table C-2. School capacity information for architects included:

- grade alignments (A16A8,A16A14, A16A22, A16A23, A1632),
- number of students (A168, A1630, A1632),
- projected enrollment. (A16A7, A16A10, A16A14), and
- square footage of the schools (A16A14, A16A23, A16A31).

As one architect wrote, "We look at the number of families expected to move in the area and determine size and scope based on the future growth expectations" (A16A11). Architects review past, current and future enrollment trends to assist superintendents in reviewing school capacity as a design element.

Summary

The U.S. Department of Education's (2000) projected enrollment of 60 million students attending public schools by 2030 contributes to the awareness of superintendents and architects to consider school capacity when designing a school. Schools are built for long-term use; therefore, it is important to consider the number of students a facility can hold without overcrowding for both current and projected school enrollments. When writing about school capacity, superintendents and architects identified current and future enrollment trends, number of students and grade level configurations as contributing elements to school design. Superintendents addressed school capacity with logistical issues, focusing on the number of classrooms, the number of teachers and the amount of space needed for specific types of classrooms (gyms, band halls, science labs, and computer areas). While architects also addressed capacity in terms of current number of students and enrollment projections, it was not a main theme within their topics for collaboration. When referencing space, architect responses centered on how teachers would use the space based on their teaching methodology more than the number of students within the space.

Superintendents included school capacity in responses to information they provide to architects, information they receive from architects, and elements to consider in a school that supports learning. Architects included school capacity in response to information they needed from superintendents.

Technology

As painted out in the literature, advances in technology during the past 50 years have led to a need for increased change and adaptability in school design (Barnett, 2001). Increased use of the personal computer and Internet in the latter part of the twentieth century has moved the economy from a base of agriculture and manufacturing to commerce and office work: “These shifts have had enormous impact on the number of everyday life, the economy, and work. Yet despite these changes, our education system remains much the same” (Microsoft Corporation, 2007, p.1).

A report prepared by the U.S. Department of Education noted that thirty-five percent of public schools were connected to the Internet in 1994, compared to ninety-nine percent by 2002 (U.S. Department of Education, 2003). Accordingly, new technologies and communication methods will require schools to adapt new instructional delivery methods. Given these changes in technology, Kennedy (2001) stated that "school facilities should not be warehouses where students are deposited for several hours a day” (p.31). Instead, schools should be designed to complement and enhance student learning. According to Cavalier (2002), educators must move from just ensuring that there is space for technology toward the fundamental question to ask when planning for technology in school design: “What does the institution want to do with or accomplish through technology?” (p.5).

Superintendent's perspective

Technology is a leading theme among superintendents' responses, with fifty-six (60%) of the superintendents addressing technology within their responses (Table C-3). Despite the large number of responses including a reference to technology, the focus of the responses from the superintendents' perspective continued to be from a logistical response. Superintendent responses referenced technology in terms of ensuring adequate space, accessibility and computer labs. Specific information referenced in superintendents' responses included having:

- computer labs (S1S70, S1S78, S1S92, S2-5S11, S2-5S23, S2-5S29, S2-5S32, S2-5S55, S2-5S63),
- space for technology (S1S67, S1S94, S2-5S42, S2-5S64),
- access to technology (S2-5S11, S2-5S14, S2-5S28),
- a media center (S1S80, S2-5S30),
- technology within the classroom (S2-5S17, S2-5S25), and
- wireless connectivity (S1S80, S2-5S21).

A missing piece within the responses from superintendents is a reference of how technology is integrated into the instructional delivery. While a few responses referenced specific types of technology, i.e. smart boards and laptops, there was an absence of the topic of technology integration into the curriculum. Superintendent responses simply referenced "technology" in their responses without expanding on it.

Architect's perspective

Eighteen (39%) of the architects referenced technology within a school space that supports learning (Table C-3). Responses from architects were similar to superintendents when referencing "technology" in general, without much expansion. Several responses indicated the need for a large media center (A16A22, A16A23) and space for technology within the classroom (A6-10A42, A16A21, A16A22, A16A23). The largest trend among the responses from architects addressed the importance of creating a flexible space to support technology (A16A5, A16A13, A16A16, A16A21, A161A22, A16123, A16A29).

Several comments from architects specifically addressed the importance of incorporating technology within the instructional delivery by addressing the needs of the teacher. Responses indicated a need to ensure the teachers had access to technology (A6-10A42, A16A17, A16A21). One architect wrote:

> We must prepare kids for the future using teaching methods appropriate to them. That means that technology must be a tool, an integral part of instruction. Every teacher and every student must have their own digital device---BUT teachers must learn to use them effectively for instruction---they need to catch up with the kids they are teaching. We must focus on higher order thinking skills, problem solving and communication skills in addition to content/knowledge skills. We must have school highly flexible so that they can constantly change in response to the changes happening in the world around them (A16A17).

Architects viewed technology as highly fluid and adaptable, indicated that teachers and instructional spaces must also be adaptable to changing needs.

Summary

When designing school facilities, including a technology plan which addresses the ability of the facility to support the integration of technology into the curriculum is important. As found in the research, Cavalier (2002) calls for schools to not only purchase technology, but to address how to use technology to enhance instructional delivery .The process involves strategic planning with school officials and architects to develop educational specifications incorporated into the school design which support and enhance technology. Within the responses from superintendents and architects, technology, including space, and accessibility were referenced. Despite the inclusion of technology into the discussion of the school design, the extent to how technology is supported through instructional delivery and student achievement is still absent. Barnett (2001) reported:

> Over the last 20 years, K-12 schools have spent millions of dollars equipping their schools with the latest technologies, but often without a thoughtful plan of how their use would impact learning and teaching. Computers like other technologies when they were new … were expected to substantially change education by simply making it more exciting and interactive. But technology use is not about the hardware, internet access and so on. What is important is how the technology is integrated with the instructional program. The guiding question

> technology leaders must keep in mind as they develop their plan is "Are students using technology in ways that deepen their understanding of academic content and advance their knowledge of the world around them? (p.1-2).

While neither superintendents nor architects addressed specific strategies for incorporating technology into the instructional delivery, architects recognized the changing technology trends by referencing the importance of flexible spaces to adapt and support technology within the teaching and learning process. Although there was not a specific question related to the use of technology within the classroom, superintendents referenced technology in general without linking it to teaching methodology which was how architects referenced technology. Within the responses from superintendents, technology was addressed with a logistical approach, specifying connectivity, number of computers and computer labs, while architects addressed how to incorporate technology based on instructional delivery methods.

Superintendent as Communicator

U.S. school districts vary in size of enrollment from thousands to fewer than several hundred students. The size of the district influences the role of the superintendent. Despite this varying role, the superintendent consistently has the role of chief spokesperson for the district. In collaboration with the school board, the superintendent is responsible for ensuring that accurate and appropriate communication is established and maintained (Hoyle, et al, 2005). While the articulation of the mission and vision of the district is often a team endeavor, the superintendent is the lead person. Konnert and Augenstein (1990) concluded:

> The superintendent is a frequent, if not constant, communicator and must develop effective communication skills. S/he must know what is to be communicated, with whom to communicate, and how to communicate. The superintendent image is often judged on the basis of the type and quality of her/his communication (p.156).

Both superintendents and architects referred to the importance of the superintendent's role in communicating the district's vision and expectations within relation to the school design process.

Superintendent's perspective

Forty-seven superintendents (50%) identified a need to communicate to architects the expectations of the community and the district's vision. When responding to the need to communicate district expectations, superintendents reported a need to see the design of facilities from a systemic approach, rather than the isolation of building a single facility. One superintendent wrote:

> Superintendents are often aware of needs that are specific to their own districts and communities. If there are such needs, it is a superintendent's responsibility to ensure that the architects are aware of those needs (S1S93).

Another superintendent wrote:

> The superintendent should share the district's philosophy about the 'feel' that the building should present, the level of quality for long-term maintenance, the level of funding for aesthetic appeal both interior and exterior, [and] the specifics of the function of the facility (S11-15S1).

Superintendents indentified the following topics that should be communicated to architects:

- district and community expectations (S1S83,S1S84,S2-5S22, S2-5S31, S2-5S37, S2-5S39, S2-5S56, S2-5S61,S16S65),
- needs of the district (S1S66, S1S78, S2-5S39, S2-5S33, S2-5S35, S2-5S38, S2-5S52, S2-5S53).
- long-term vision for the school district (S1S85, S1S87, S2-5S16, S2-5S21, S2-5S45,S6-10S7, S6-10S9), and
- type of construction preferred (S2-5S53, S2-5S55).

Table C-4 contains a complete list of the superintendents' responses related to the superintendent as a communicator. Within these responses, it is evident that superintendents recognize the importance of sharing with architects the issues that make the district and community special in relation to other communities.

Architect's perspective

Twenty of the architects (43%) specifically responded with a need for the superintendent to assume the role as an effective communicator and visionary leader for the goals of the design project (Table C-4). Architects need superintendents to communicate the schedule or timeline needed for the project, the desires of the community, and the vision or mission of the district. One architect wrote:

> The superintendent should have a leadership role in planning schools. He/she should set the expectations of the district. The superintendent should assemble other users to be part of the process also (A16A21).

Another architect wrote:

> The best leadership comes from superintendents who are collaborative leaders. The best input comes from those who clearly layout boundaries to their staff and let them be involved in the design process. The most important role a superintendent can play is that of the conduit to the public. Intelligent selection of community leaders in pre-bond planning, picking good internal and external leadership is critical to a bond program's success. No one else is positioned to play this role. Superintendents are often less effective in 'micro-managing' the details of the actual design process than in 'articulating the vision' laying out the strategy for the public relations. Without a successful election, there will be no new schools (A16A18).

Architects urge superintendents to lead the collaboration of the design process by gathering information about curriculum, capacity and budget guidelines from the appropriate departments. All of these areas will assist to enhance the collaboration in the school design process.

Summary

Superintendents and architects are similar in their views of the superintendent as a lead communicator within the design process. Hoyle et al (2005) and Konnert and Augenstein (1990) found that part of the responsibility of a superintendent is to be an effective communicator. While input is received from many stakeholders, the superintendent, as chief executive officer for the district, is responsible for ensuring that the community's expectations and the district's vision are incorporated into the collaboration of the school design process. Both superintendents and architects view the process as collaborative, with input from many stakeholders; however, the superintendent is charged with communicating this. Responses from superintendents referenced a need to have an awareness of the community's needs and expectations, long-term district vision and needs of the district and to be able to effectively communicate these. Architects echoed this response. One architect specifically referred to the superintendent as a conduit to the public. Further analysis of their responses indicated from superintendents a high need to communicate this information to architects coupled with architects reporting a high need to receive this information from superintendents.

Design Trends

Schneider (2002) concluded that "school facilities affect learning. Spatial configurations, noise, heat, cold, light, and air quality obviously bear on students' and teachers' ability to perform" (p.16). Architects must be experts in proposing design trends that will address these issues within the design of the school in order to maximize student academic potential: "Schools built today must be designed to not only meet the needs of today's students, but of multiple future generations of students that will live and learn in a constantly and rapidly changing world" (Fisch, 2008). Green (2002) found that well-designed buildings and pleasant surroundings lead to better behavior and attitudes among students.

Superintendent's perspective

Forty-two (45%) of the superintendents responded with the need for architects to provide information to them about current design trends and optimal design solutions (Table C-5). One superintendent indicated, "The architect should be able to tell you what other schools are doing… and help with innovative design" (S2-5S22). Superintendents want information from architects regarding:

- new and innovative approaches (S1S69, S1S88, S1S92, S2-5S20, S2-5S22, S2-5S43, S11-15S2),
- cost-efficient design approaches (S1S69, S1S93, S2-5S50, S2-5S55, S6-10S6, S16S65),
- emerging design trends (S1S94, S2-5S23, S11-15S3, S16S65),
- what other schools are building (S1S84, S1S88, S6-10S6),
- best practices in design (S1S72, S1S87), and
- "green" schools (S11-15S3, S16S65).

While there is an importance of knowing new trends and innovative approaches to school design, superintendents must also know innovative approaches targeted at saving long-term costs and designing buildings that are cost-efficient in terms of operating and maintaining.

When seeking design trends from architects, superintendents were specifically concerned with the issue of spatial layout. Superintendents addressed a need to communicate to architects how spatial layout of a design can contribute to student learning. Superintendents' responses indicated the following when referencing spatial layout in relation to student learning:

- "technology and media center, adequate lab space, large enough classrooms, space for student programs (Career and technology programs, dance, gyms for sports, etc)" (S2-5S25),
- "in this day we need several smaller rooms or divided rooms other than regular classrooms to accommodate special programs with smaller student to teacher ratios" (S2-5S34),
- "needed square footage per student, technology needs, lab requirement needs, etc. down to the width of the hallways plays a supporting role. Example: If the hallways are too narrow, then conflicts increase and the attention of the students is drawn from their classroom activities to hallway activities" (S2-5S18), and
- "Room size to support desks and computer stations. Labs for science. Conference room to be used for ARD's [special education committees],

department meetings, administrative meetings, etc. Build for growth. Adaptable. Hallways that can be monitored from administration offices. Access to public through one door" (S2-5S56).

Adequate space to support square footage for special classrooms and facilities designed for growth and security are important to superintendents when supporting student learning.

Architect's perspective

The most significant information architects wrote they provide to superintendents involved "best practices" in school design. Twenty-six architects responded to the need to share design trends when designing a school facility. Table C-5 contains all of these responses. Architects seek to help superintendents know what the current design trends are as well as what other school districts are building. Responses from architects included communicating optimal design solutions in regard to:

- spatial concepts that support better learning environments (A6-10A42, A16A4, A16A5, A16A13, A16A14, A16A16),
- "design solutions," (A16A14, A16A19),
- "optimal solutions to meet their [districts'] challenges" (A6-10A39), and
- "state of the art status check related to school design (current trends, forward looking)" (A16A26).

As well as current design trends, based on past experiences, architects provide information on optimal solutions. As one architect expressed,:

> We keep track of elements, whether it is a design or a specified item that were a success and those that were failures (A16A11).

This information is shared with superintendents to assist in "guiding" them through the design process. One architect wrote:

> We try very hard to share the information gathered and experience gained through all our projects with superintendents in the process of designing school facilities. We see ourselves as a resource to help superintendents plan for the future. Ultimately, the superintendents make the decisions, but we are there to help them consider / explore options (A16A17).

Information on the relationship between the school design and the educational outcomes of the school proves important for architects to communicate to superintendents when designing a school to support student learning.

While architects, like superintendents, perceived the importance of spatial layout as an optimal design solution considered in current design trends, the definition of spatial layout is different. Architects viewed spatial layout in terms of configuring areas that create optimal areas for learning. Responses from architects included:

- "areas where children can teach other children. When a child is able to teach their peers they show mastery of the material. More schools need to encourage this process with open, flexible learning environments" (A6-10A39),
- "Opportunities for collaborative learning outside the traditional classroom setting. Opportunities for outdoor learning" (A16A3),

- “Flexibility for different group sizes, activities [and] schedules. Opportunities for interaction, option & choices, Stimulating, non-generic spaces [that create] a sense of belonging and caring” (A16A4), and
- “A concept for student learning is the most important first step. 99% of the time, educators start with assumptions about how student learning works and focus on minor nuts and bolts. They should push hardest on big ideas about teaching and learning---then get to the details. We should not start with the assumption that schools will have classrooms, instruction regulated by bells, instruction one subject at a time, stand and deliver, etc” (A16A9).

Perceptions of architects indicated that in order to design a space that maximizes student learning, they need for educators to focus on how the teaching and learning occurs in the classroom.

Summary

Schneider (2002) found that the design of school facilities to address spatial configurations, noise, heat, cold, and light can affect student learning. When collaborating on school design, superintendents need architects to become the experts in communicating trends in school design. Forty (95%) of the forty-two responses from superintendents on design trends were related to information they need from architects. Twenty-six (76%) of the thirty-four responses from architects about design trends were related to information they communicate to superintendents. In general, responses from superintendents focused on topics addressing best practices, emerging design trends, new and innovative design, and best practices. Architects' responses addressed the need to communicate best practices, and optimal design solutions to superintendents. Both superintendents and architects specifically addressed spatial layout when referencing design trends.

Both the superintendents' and the architects' definitions of spatial layout are important aspects to consider when designing a school to support student learning. Therefore, both groups must collaborate from both perspectives to develop a shared perspective of how the space that is used will enhance the design process. When answering the question what in a school supports student learning, superintendents and architects shared a common recognition that maximizing the spatial layout effects everything within the school building. One response from a superintendent summed it well, "All of the facility should, in some way, directly or indirectly support student learning" (S2-5S18). Likewise, an architect responded to the question with, "The answer is everything that promotes and enhances student achievement and outcomes" (A16A10). Superintendents and architects share the understanding that the entire building can impact student learning.

Design trends is a topic superintendents and architects address when collaborating to design a school. Based on the responses, the topic was identified in responses from superintendents for information they need and in responses from architects referencing information they communicate. This relationship identifies that architects are communicating information that superintendents need when collaborating to design a school.

Curriculum Programming

Kennedy (2001) stated "school facilities should not be warehouses where students are deposited for several hours a day" (p.31). Instead, schools should complement and enhance student learning. Stevenson (2006) believes that "how school facilities best support the education of students in the coming ten to twenty years is wholly dependent of what the educational programs will be (p.14)."

Superintendents and architects both indicated the importance of communicating curriculum programming when designing a school facility. Despite this similarity, both groups differed on their perspective of the approach to communicating curriculum programming. While superintendents assumed a logistical approach on the issue in relation to number, size and location of curriculum programs when designing a school, architects were more concerned with the process and methodology of teaching and learning in relation to school design.

Superintendent's perspective

Thirty seven (39%) of the superintendent respondents wrote of the need to communicate curriculum programming as an important factor within the design of the school (Table C-6). Curriculum programming responses included communicating,

- information regarding what programs are offered in the school (S1S72, S1S89, S2-5S23, S2-5S64, S6-10S7, S11-15S2),

- the number of students and/or classrooms (S1S88, S2-5S13, S2-5S17, S2-5S26, S2-5S49, S11-15S1), and
- number or types of science or computer labs needed (S1S78, S2-5S53, S2-5S26).

Superintendents responded to curriculum programming in terms of grade level configurations, and the space needed based on the age of the student. Respondents also indicated the importance of communicating the types of special programs and extracurricular activities held within the school facility. In response to what should be included in a school that supports learning one superintendent wrote:

> I'm sure that there will be a lot of answers that try and incorporate current curriculum into the design, but I believe curriculum to be so fluid that this is an exercise in futility. Having a structure built to last for generations that is both extremely flexible and efficient, with an emphasis on usability for the long-haul, would meet the needs of many, many children (S1S93).

Architect's perspective

Twenty-seven (59%) of the architects indicated communicating curriculum programming to guide the design of the school facility (Table C-6). Architects wanted to know the educational and curricular goals outlined by the district in order to "incorporate design elements that supported unique learning opportunities" (A16A3).

Architects seek the instructional methods desired by the district, including instructional delivery, technology uses, and small group configurations within the classroom. Responses from architects centered on wanting to know the,

- teaching methodology (A2-5A36, A6-10A42, A11-15A44, A16A5, A16A9, A16A13, A16A15, A16A16, A16A17, A16A24, A16A28, A16A30, A16A32),
- district's program requirements (A16A5, A16A10, A16A14, A16A20, A16A22, A16A23, A16A30, A16A33),
- educational goals of the district (A6-10A42, A11-15A44, A16A8, A16A13, A16A15, A16A16, A16A28), and
- educational vision of the district (A11-15A44, A11-15A45, A16A9, A16A13, A16A17, A16A18, A16A30).

Specifically, one architect stated that:

> We [architects] need to understand the district's aspirations for teaching and learning. We also need to know about their technology systems and how they support teaching and learning (16A9).

Another architect wrote:

> We [architects] need real in depth concepts for how the district wants learning to work – and how they want to teach to realize that learning … they must be clear about teaching and learning first – that is the base from which everything else springs (A16A17).

Summary

Kennedy (2001) stated that schools should not be warehouses for students, but should complement the learning process. Superintendents and architects both indicated within their responses a need to include curriculum programming within the discussion of the school design. While superintendents approach the topic from a logistical stance, communicating the number of classrooms and types of programs offered, architects approached the topic from a pedagogical view, indicating a need to know teaching and learning beliefs and methodologies. Superintendents want a building that will have long-term sustainability, independent of current curriculum trends, while architects are concerned with designing a building that will incorporate current instructional delivery methods and learning styles.

School Climate

When designing, planning and constructing any school, it is important that the design of the school be based on the understanding that the physical facility influences the learning climate.

> The environment of a given educational facility has a considerable effect on the daily activities of those using the facility. Students, teachers and staff can't always verbalize what they like about the physical details of a building but they recognize the effect the building has on them. Research has shown that the condition of a school building definitely affects student achievement and student

> behavior and that there are elements of facility design that are perceived to improve the learning climate (Maiden & Foreman, 1998, p.40).

When designing a school to maximize student learning potential, the impact the environment has on both the student and the teacher becomes an important consideration within the design process.

Research studies reported that the quality of a school facility, the materials used, indoor air quality, interest-grabbing design features, use of daylighting, acoustic designs and more, impact the academic performance of students (Weinstein, 1979; McGuffey, 1982; Bowers and Burkett, 1989; Lemasters, 1997). Kennedy (2001) and Kats (2006) identified trends in school design that included ecologically friendly schools that incorporate features to conserve energy. Mahone (1999) linked the effects of incorporating daylighting in design to improved student achievement. Addressing these trends when planning the school design process will help school facility planners maximize the investment of the school facility and its impact on school climate.

Superintendent's perspective

Thirty-three of the superintendents (35%) recognized that design solutions that address healthy learning environments are important to support a school climate (Table C-7). Responses for healthy environments that support learning within the school climate included schools that consider:

- natural lighting (S2-5S16, S2-5S22, S2-5S24, S2-5S38, S2-5S58),
- Indoor Air Quality provisions (S11-15S3, S6-10S10, S2-5S11),

- lighting considerations (S11-15S3, S6-10S10, S1S77),
- "an aesthetically pleasing environment" (S11-15S2),
- noise levels (S6-10S10), and
- types of lighting to be used (S2-5S19).

Responses from superintendents indicated a general response to include lighting, acoustics, and air quality into consideration when designing a school.

Architect's perspective

Eighteen (39%) of the architects wrote that conveying school design elements that create and support a healthy environment is essential to addressing school climate (Table C-7). The elements of a healthy environment were best defined by the following responses from architects:

- "Healthy environment: indoor air quality, natural lighting, [and] acoustic enhancement" (A16A14),
- "access to daylighting. Many reports show that access to daylighting improves learning" (A6-10A39),
- "good acoustics in learning environment, enhanced audio in the classroom, [and] natural lighting" (A16A21), and
- "natural light, acoustics (good), reflective surfaces, [and] indoor air quality" (A16A27).

Architects perceived the importance of designing a school facility that supports student learning by taking into account the senses of a learner, including sight, smell, and sound.

Summary

Research studies have found the condition of a building, including indoor quality, daylighing, and acoustic designs to contribute to student learning (Weinstein, 1979; McGuffey, 1982; Bowers and Burkett, 1989; Lemasters, 1997; Kennedy, 2001; Kats, 2006). Despite a growing research on the effects of a healthy environment on learning, including daylighting and green schools, only 33 superintendents and 18 architects referenced a healthy environment in their responses . While superintendents and architects were similar in their responses to incorporate the consideration of noise, lighting, and air quality into the discussion of school design, only one-third of the responses addressed school climate. It is likely that the absence of this topic within the discussion of the school design is related to the primary financial concerns superintendents and architects indicated when designing a school. With a focused intention on concerns with costs and cost-saving measures, coupled with a need to build large enough to support projected enrollments, it is likely that superintendents are not as focused on design trends that might contribute to additional costs for the project.

Safety

With an increase in high-profile school shootings, schools are answering the question "How do schools ensure a safe physical environment? (Schneider, 2007). The No Child Left Behind Act connected school safety to student achievement in the belief "all children need a safe environment in which to learn and achieve" (Schneider, 2007,

p. iii). Therefore, *s*uperintendents and architects were specifically asked, "What should be included in a school that supports safety?"

Schneider (2007) addressed the concept of Crime Prevention Through Environmental Design (CPTED) which is a critical component of school safety planning:

> A site that is well protected with natural surveillance, access control, and territoriality will require less staff time and energy to maintain as a safe environment. This leaves instructors more time to focus on teaching, and students more time to focus on learning (p.52).

One architect response specifically addressed the need to consider CPTED when addressing school safety (A16A28). Analysis of the responses from superintendents and architects indicated accessibility, surveillance, and visibility were the three leading responses from both groups. Table 5 illustrates the items superintendents and architects indicated to include in a school that supports safety. Table C-8 includes the responses from superintendents and architects referencing school safety.

Both superintendents and architects focused primarily on accessibility to the school through a common entrance, referred to by architects as a security vestibule, as the primary contributor to school safety. As one superintendent wrote,

> Safety has become a major concern in recent years and schools should be capable of monitoring entrance into every building and room as well as being capable of providing immediate lock down of exterior doors (S2-5S58).

TABLE 5. Responses from Superintendents and Architects in Regard to Supporting School Safety with the School Design

Item needed to support School safety	# of Superintendents' Reponses (% of superintendents)	# of Architects' Responses (% of architects)
Entrance / Exit access	51 (54%)	22 (54%)
Security cameras	46 (49%)	22 (54%)
High visibility areas	21 (22%)	9 (22%)
Emergency (fire / weather) alarm systems	21 (22%)	6 (15%)
Technology / communication devices	20 (21%)	5 (12%)
Escape routes	15 (16%)	1 (2%)
Lighting	13 (14%)	2 (5%)
Special doors / windows	12 (13%)	6 (15%)
Fencing	6 (6%)	1 (2%)
Positive relationships with students		3 (7%)

An architect echoed the sentiment by writing,

> The number one element is secured entry. This is typically done with card access at all doors and a security vestibule at the front of the school. The security vestibule requires visitors to the school to enter through the main administration

> area to check in before gaining access to the school. Other elements can include security cameras, metal detectors and security personnel (A16A11).

Both superintendents and architects recognized the importance of security at the entrance of a school facility. Both groups were also similar in their responses to use advanced technology including camera surveillance systems, electronic ID access cards for doors, and communication systems to support safety throughout the school.

Architects were the only group to acknowledge the relationship between a positive student/teacher relationship and school safety. One architect wrote that within a school that supports safety should be:

> Strong relationships between kids and adults. Threats to school safety are much more an internal than external problem---and that stems from having schools full of kids that no one really knows or cares about (A16A9).

Another architect wrote that "facilities that foster a cohesive social environment, including safety, visibility, and a sense of community within the school" (A11-15A44) create an atmosphere that promotes school safety.

Superintendents and architects are likely to continue to focus on school safety when collaborating on the design of schools. As technology advances continue, so will the avenues in which school safety can be addressed and monitored. The topic of safety will continue to plan an important role in the school design process.

This chapter has addressed each of the areas of knowledge that play an important role in the collaboration between superintendents and architects when designing a school. When addressing each of these areas, a facilities committee is often compiled to contribute to the school design process.

Facilities Committee

While the communication on the school design process is led by the superintendent and architect, the process often involves members of a committee. Therefore, superintendents and architects were specifically asked who they would involve in the school design process.

Stevenson (2006) supports the collaboration in the school design process by "encouraging dialogue across all segments of the greater community [which] is essential to defining education and assuring, then, that facilities reflect and support it" (p.14). Superintendents and architects must work together to design schools that learn (Senge, 2000; Fish, 2008). When viewing the school as a learning organization, individuals must recognize that every organization is a product of how its members think and interact, and learning must be seen as a connection that is driven by vision. Traditional methods of strategic planning must be replaced with future-based planning methods, incorporating a systems-thinking approach involving a representation of all stakeholders (Mylen, 2002).

When responding to the question who should be involved in the planning process for designing a school, superintendents and architects shared some common individuals. Both groups included key players such as the board members, superintendent, principal, teachers, and community members. Individuals from maintenance and grounds, food service, transportation, technology, fine arts, and athletics were also commonly mentioned. Both superintendents and architects described a need for individuals involved in the planning process to include “key users” and “stakeholders” of the facility.

Superintendents tended to be more specific in the types of staff to include in the planning process, specifically identifying science and special education teachers, auxiliary staff, finance department members, nurses and librarians as important to the process. Four superintendents also mentioned safety officials such as campus police and safety directors. One superintendent stated:

> Initial planning should include Board Members, parents, teachers, administrators, maintenance, etc. Once general characteristics [are] defined, a smaller team comprised of administrators, architect and contractor should meet regularly (S2-5S13).

Unlike superintendents, architects uniquely responded to several different groups to include in the planning. Eleven architects (24%) specifically identified curriculum directors or assistant superintendents of instruction as important for the planning process. While both superintendents and architects mentioned including administrators or central office staff, only architects specifically named administrators with curriculum responsibilities as important participants to be included. Architects included both civil and structural engineers in the planning. Architects also included students in the planning process, while superintendent responses included students when a high school was the design project.

One architect wrote that individuals involved in the planning process should be "high enough to have authority, but broad enough to be representative" (A11-15A44). Another response from an architect claimed that when deciding who to involve in the process, include:

> Everyone. I have found that all employees of a district that will be using the new facility want to and need to be involved in the planning so that each one feels important in the planning process and has a chance to contribute to the process. The lowest paid employee working for a district can have significant suggestions for the architect and should not be overlooked (A16A2).

Superintendency Program

In Texas, the superintendent of schools for each school district is responsible for promoting students' success. Under the Texas Administrative Code (2004), in chapter §242.15, the superintendent is also accountable for the management of the district's physical plant and support systems to ensure a safe and effective learning environment. Given the multiple roles and responsibilities of the Texas superintendent for both the academic excellence of students and the management of the physical plant, superintendency programs in Texas prepare the superintendent to meet these requirements by specifically addressing the role of the superintendent within planning school facilities. Therefore, superintendents were asked, "Did your superintendency certification program prepare you to collaborate with an architect to design a school building?" A follow-up question asked, "If you did not learn this through a superintendency program, where did you learn this skill?"

Of the 94 superintendents, only twenty-five (27%) responded that they learned this skill through their superintendency certification program. The most significant number of responses (53%) indicated that superintendents learned this skill through on-the-job experience. Table 6 illustrates the responses from superintendents referencing how they learned the skill of collaborating with an architect. Most responses regarding on-the-job experience included references to holding other positions within the district prior to the superintendency, such as an assistant superintendent.

Several responses indicated that the superintendency program was good; however, the specific skill in working with architects was obtained with additional experience. One superintendent wrote:

> I learned basic information in my superintendency program, but I learned most of it on the job working as an assistant superintendent under a great superintendent and later as a superintendent working with a great architect (S2-5S50).

Another superintendent responded:

> The superintendency program is designed to teach us to be educational leaders, not construction supervisors. We learn this skill through working in districts where construction is taking place and being involved in the process as an assistant superintendent or campus administrator (S6-10S9).

Whether through on-the-job training, or working with architects, attorneys or other superintendents, collaboration with others was a central theme in the method superintendents used to obtain the skill of working with architects.

TABLE 6. Method Superintendents Reported when Learning the Skill of How to Collaborate with an Architect

Method	# of Superintendents' Responses (% of superintendents)
On the job experience	50 (53%)
Superintendency program	25 (27%)
Working with other superintendents	13 (14%)
Workshops	11 (12%)
Previous experience working with an architect	10 (11%)
Trial and error	7 (7%)
Previous construction experience	4 (4%)
Working with attorneys	3 (3%)
Through reading materials	1 (1%)

This concludes the analysis of the responses from superintendents and architects. Appendix C contains the data tables of the responses for each of the areas referenced in this chapter. The summary of the findings are discussed in Chapter V.

CHAPTER V

SUMMARY, FINDINGS AND RECOMMENDATIONS

This study was conducted for the purpose of identifying the areas of knowledge need by superintendents and architects to enhance their collaboration in the school design process. The study population consisted of ninety-four Texas public school superintendents and forty-six architects, all with experience in designing at least one school. An analysis of the responses from superintendents and architects provided those areas referenced by superintendents and architects in their collaboration in the school design process. I derived my conclusions from the superintendents and architects' survey responses. These findings and recommendations are discussed in this chapter. Because of the interrelatedness between the findings and the recommendations for practice, I will discuss them together. Recommendations for future research will follow separately.

Research Questions

This study explored the collaboration occurring during the school design process when superintendents and architects combine their knowledge. The present study focused on the following specific questions:

1. What information do superintendents and architects need to provide to their counterparts when planning the school design?

2. What information do superintendents and architects need from their counterparts to help them make decisions when planning the school design?
3. What do superintendents and architects expect to see included in a school that supports student learning?
4. What do superintendents and architects expect to see included in a school that supports student safety?
5. Who should be involved in the planning process?
6. Where do superintendents obtain knowledge on how to collaborate with architects when designing a school?

I analyzed responses from the first three questions separately to form categories and then grouped together to form themes. The themes which emerged became the areas of knowledge within the collaboration between superintendents and architects. These areas of knowledge are: budget, school capacity, technology, superintendent as communicator, design trends, curriculum programming, and school climate. My analysis of these questions yielded the first three findings discussed later in this chapter. Responses to the three remaining questions regarding safety, facilities committees, and superintendent preparation programs were analyzed separately. Each of these areas resulted in a finding presented further in this chapter.

The Findings

Finding 1 - Budget

Budget is the driving force within the collaboration between superintendents and architects when designing a school. When asking superintendents and architects what they need to communicate or need information about, budget was the leading topic among both groups. Despite a national push to increase student achievement, little funding has been provided to support construction costs for new or modernized schools. The financial burden for these costs lies with the local school district; therefore, most local funding for school construction comes from voter-approved bond elections and property taxes. The remaining amount comes from state assistance. With expenditures for new construction approved and monitored outside of the district's budget, the responsibility for efficiently using these taxpayer dollars lies with the superintendent and the school board.

The financial burden associated with designing a school becomes apparent in the responses from superintendents, indicating the number one issue they must communicate to architects when designing a school were the parameters of the budget. The architects' responses clearly indicated that they shared this concern with superintendents. Budget was the number one issue that architects indicated they needed from superintendents when collaborating on school design. The literature is clear in validating that a budget for school construction is a big concern. With an estimated $322 billion needed to fund new construction and modernize schools, budget is a national issue (NEA, 2000).

Recommendation. Given that budgets are an important reality, superintendents need to continue to communicate the parameters of the budget to architects. Despite limited budgets, superintendents must view budgets as a way to prioritize needs rather than to limit possibilities. Superintendents should work with architects to explore possible design options before determining that they are not within the budget. Architects, in turn, must work diligently to provide designs that work within realistic districts' budgets and expectations. Together, superintendents and architects will be able to prioritize design selections based on needs and dollars to maximize a design that will support student achievement.

Finding 2 – Key communicator

The superintendent is the key communicator of the district's needs and hence, the community's expectations for the design of a new school. Responses from superintendents clearly indicated that the superintendent feels responsible for communicating what a district/community needs and expects. Likewise, architect responses indicated that they need the superintendent to communicate these expectations in order to design a school specific to the community. Hoyle et al (2005) references the superintendent as the chief executive officer, responsible for communicating the district's vision and community expectations.

While input is gathered from many stakeholders within the design process, the lead role for communication remains with the superintendent. The superintendent serves as the conduit for communication between the architect and the community and school board members.

Recommendation. Communication is a skill. Superintendents must continue to be aware that they are the lead communicator in the school design process. Therefore, superintendents must continue to work on honing this skill to effectively represent their district and community's needs, expectations, and vision.

Finding 3 – Instructional focus

Architects are the individuals in the school design process who continue to focus on using the instructional delivery methods used by teachers to guide the design process. In responses referencing school design, architects continually expressed a need to better understand the teaching methodology and instructional pedagogy used by teachers within the schools. This information was important for architects in order to design a school to supports such specific methods. Architects referenced such curriculum standards and classroom instructional methods would be delivered in the classroom in order to better address spatial layout, technology, and school capacity issues within the design of the school. Yet, superintendents were less likely to reference teaching pedagogy and instructional delivery. Instead, superintendents' responses centered on logistical approaches of design based on number of classrooms, teachers, and students served within the facility.

This finding is not completely unexpected. A possible explanation is that architects are the experts on designing schools to support student learning. They have a knowledge base of design elements that specifically address pedagogy and are able to recommend those. And likewise, with budget as a primary concern for superintendents, they recognize that school facilities are built for longevity. Instructional delivery and methodology may be perceived by superintendents as fluid and not important when designing a school to last the next fifty years.

Recommendation. Superintendents must be prepared to communicate instructional delivery methods and expectations to architects. While the design of a school may not be centered on current teaching practices, it must obviously support student achievement. Therefore, superintendents need to be able to incorporate functionality of the design with instructional delivery in the classroom.

Finding 4 – Safety

Three main areas to address when designing a school to support student safety are accessibility, surveillance and visibility. Responses from superintendents and architects aligned in their raking of accessibility, camera surveillance, and visibility as the main three issues to address when designing a school to support student safety. Schneider (2007) addressed the concept of Crime Prevention Through Environmental Design (CPTED), which recognized natural surveillance, access control, and territoriality as key elements to support a safe environment, allowing teachers to focus on teaching and students to focus on learning. With society continuing to focus on school shootings, safety in schools will continue to be a prioritized concern.

Recommendation. Superintendents and architects should consider accessibility, camera surveillance, and visibility when designing schools to support student safety. Architects' responses also included the important role positive relationships between kids and adults in creating an atmosphere within the school that is supportive. While architects are equipped with the knowledge to include design features that will help support safety, they also recognize that the climate within the school is also significant. This finding is aligned with U.S. Department of Education (2008) research on the importance of creating strong relationships with high school students through smaller learning communities. Therefore, superintendents must address school climate to better assist in promoting school safety from both an internal and external approach.

Finding 5 – Facilities committee

Instructional specialists, specifically at the district-level, are often not included as a part of the facilities committee when designing a school. Responses from superintendents and architects also aligned when including board members, superintendents, principals, teachers, and community members as key stakeholders when seeking input on the school design process. Individuals from maintenance and grounds, food service, transportation, technology, fine arts, and athletics were also commonly mentioned. However, curriculum specialists such as curriculum directors, assistant superintendents for instruction, and instructional facilitators appeared specifically only in the architects' responses. My personal experience includes eight years as a district-level curriculum specialist in two different districts, in which three building projects were conducted. In none of these projects was I nor any member of the curriculum department included in the committee to design these schools. The literature review supports the relationship between the school building and student achievement (Earthman, 2002; Earthman & Lemasters, 1998; Lyons, 2001). While principals and teachers are often included on facilities committees, these individuals mainly focus on instruction and curriculum that is often specific to their campus. On the contrary, district-level curriculum specialists are knowledgeable in the instructional vision from a district perspective. So these individuals communicate both where the district is and where the district is going in terms of instructional delivery and methodology. Therefore, the absence of district-level curriculum specialists in the design process negatively impacts the potential for a necessary relationship between the design of the school and student achievement to be enhanced.

Recommendation. Facilities' committees should include instructional leaders and curriculum experts within the district as a part of the school design process from beginning to end. Input from curriculum specialists supports the need of architects to obtain information on the teaching pedagogy and instructional philosophy of the district. Including specialized curriculum experts, such as technology directors, would also enhance the use of technology in relation to instructional delivery. These individuals would provide the district's long-term technology plan. Curriculum specialists provide support to superintendents when making decisions about instructional delivery and the ability to use the school as an additional resource to enhance student learning.

Finding 6 – Knowledge of design process

Superintendents obtain the knowledge and the skill to collaborate with architects on a school design process through on-the-job experiences. Superintendents' responses indicated that the mostly likely avenue to obtain the skill of collaborating with architects in the school design process is through on-the-job experience. Most superintendents indicated this experience came in the form of positions as an assistant superintendent or through mentorships with other superintendents. While superintendents recognized that their superintendency programs were beneficial in addressing the school design process, they were not the primary source to prepare them fully for school design. Instead, superintendents had to rely on previous experience, often with a strong collaboration or mentorship from other superintendents.

Recommendation. It is important for superintendents who are designing a school project to have experience in participating in the design process prior to their superintendency. In addition, superintendents often collaborate with other superintendents with experience to guide and assist them in the process. This mentorship becomes a valued resource for superintendents. Workshops, conferences, and superintendent preparation programs must include more mentorships and collaborations with superintendents in the format of instructional delivery on the school design process.

Recommendations for Further Research

In order for the design of schools that enhance student learning to build on previous knowledge, it is imperative that rigorous educational research continue in the area of school design and the collaboration of the design process.

This case study identified the topics important within the conversation between superintendents and architects when designing a school. Through the literature review, this type of study appeared to be unique, in that the purpose of the study specifically focused on the collaboration between superintendents and architects. Further research studies should be conducted to examine the collaboration process between superintendents and architects when designing a school and further enhance the knowledge base of this phenomenon.

This case study specifically explored avenues in which superintendents obtain the skill of communication with architects. The findings indicated the important role mentorships play for superintendents. Further research should be conducted to examine the educational programs that provide mentorships for superintendents that prepare them to design a school facility. Understanding educational programs that are successful in providing superintendents with the information they need within the design process would benefit other programs, and institutions that address school design.

The leading topic of discussion within the school design process, as found within this study, addresses budget. Further research should be conducted to examine funding of modernizing and designing schools. When designing schools, both superintendents and architects include budget as the main topic of discussion. With an increased knowledge base of ways to fund modernizing and designing schools, superintendents and architects can shift their focus away from the limitations often limited by a budgetary focus.

The expected result of an effective school design is a facility that supports student learning. As indicated within this study, architects and superintendents need to understand how the school design process can incorporate instructional delivery process. Further research should be conducted in how instructional delivery / teaching-learning processes should drive school design. Knowing this will help yield a school that is designed to best meet the instructional mission of the district.

By focusing on the collaboration between superintendents and architects when designing a school, several areas of knowledge are important to include in the school design conversation. Further research should be conducted in each of the areas of knowledge in relation to school design. These areas include budget, school capacity, technology, superintendent as communicator, design trends, curriculum programming, school climate and safety.

Final Thoughts

As the population of students attending public schools in Texas and other states continues to rise, and state resources fall short of increased budget demands, it will be significant for superintendents and architects to design schools that will enhance student learning while maximizing tax dollars. Therefore, the collaboration between superintendents and architects becomes increasingly important.

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APPENDIX A

SURVEY INSTRUMENT

Architect's Contributions to the School Design Process

Thank you for taking the time to answer a few questions regarding your contributions in the school design process. I anticipate the survey to take 10-15 minutes to complete.

1. Are you an architect with experience in planning schools?
   Yes
   No

2. What information or guidance do you need from superintendents to help you make decisions when planning the school design?

3. Who should be involved in the planning?

4. What information do you think you need to provide to superintendents when planning the school design?

5. What should be included in a school that supports student learning?

6. What should be included in a school that supports school safety?

7. How many years of experience do you have in planning and designing schools?

   First year
   2 – 5
   6 – 10
   11 – 15
   16 or more

8. How many schools have you planned and designed?
   1
   2 – 5
   6 – 10
   11 – 15
   16 or more

Thank you for taking the time to participate in this survey.
Please check here if you would like to receive a copy of the findings from this research.

Superintendent's Contributions to the School Design Process

Thank you for taking the time to answer a few questions regarding your contributions in the school design process. I anticipate the survey to take 10-15 minutes to complete.

1. Have you participated in planning the design of a new school?
   Yes
   No

2. What information do you think you need to provide to architects when they begin designing a school?

3. Who should be involved in the planning?

4. What information or guidance do you need from architects to help you make decisions when planning the school design?

5. What should be included in a school that supports student learning?

6. What should be included in a school that supports safety?

7. How many students are in your district?
   0 – 499
   500 – 999
   1,000 – 4,999
   5,000 or more

8. How many years of experience do you have as a superintendent?
   First year
   2 – 5
   6 – 10
   11 – 15
   16 or more

9. How many schools have you built?
   1
   2 – 5
   6 – 10
   11 – 15
   16 or more

10. Did your superintendency certification program prepare you to collaborate with an architect to design a school building?
    Yes
    No

11. If you did not learn this through a superintendency program, where did you learn this skill?

12. Thank you for taking the time to participate in this survey.
    Please check here if you would like to receive a copy of the findings from this research.

APPENDIX B

COVER LETTER TO THE PARTICIPANTS

Dear Architect,

I am conducting research on the collaboration between superintendents and architects in regard to the school design process. The purpose of this study is to strengthen the collaboration between architects and superintendents when designing school facilities to support student instruction. You were selected to be a possible participant because you are an architect with CEFPI.

If you agree to participate in this study, you will be asked to complete a 10 -15 minute survey. The survey is located at http://www.surveymonkey.com/s.aspx?sm=FDbJxz2LzSLABrbJDo_2bd5A_3d_3d. The risks associated with this study are minimal, and are not greater than risks ordinarily encountered in daily life.

You will receive no direct benefit from participating in this study; however, information from this research will be provided to architects and superintendents to strengthen their collaboration in an effort to build better school facilities.

Your participation is voluntary. You may decide not to participate or to withdraw at any time without your current or future relations with Texas A&M University being affected.
The records of this study will be kept private. No identifiers linking you to this study will be included in any sort of report that might be published. Research records will be stored securely and only Deanna Lovesmith, principal investigator, will have access to the records.
If you have questions regarding this study, you may contact Deanna Lovesmith, lovesmith@hot.rr.com.

This research study has been reviewed by the Human Subjects' Protection Program and/or the Institutional Review Board at Texas A&M University. For research-related problems or questions regarding your rights as a research participant, you can contact these offices at (979)458-4067 or irb@tamu.edu.

Please be sure you have read the above information, asked questions and received answers to your satisfaction. If you would like to participate in this study, please go to http://www.surveymonkey.com/s.aspx?sm=FDbJxz2LzSLABrbJDo_2bd5A_3d_3d.

Thank you for your time and participation,

Deanna Lovesmith
Texas A&M doctoral student

Dear Superintendent,

I am conducting research on the collaboration between superintendents and architects in regard to the school design process. The purpose of this study is to strengthen the collaboration between architects and superintendents when designing school facilities to support student instruction. You were selected to be a possible participant because you are a Texas school superintendent.

If you agree to participate in this study, you will be asked to complete a 10 -15 minute survey. The survey is located at
http://www.surveymonkey.com/s.aspx?sm=4_2bgL1WNxUauF6WDMOl7NSQ_3d_3d
The risks associated with this study are minimal, and are not greater than risks ordinarily encountered in daily life.

You will receive no direct benefit from participating in this study; however, information from this research will be provided to architects and superintendents to strengthen their collaboration in an effort to build better school facilities.

Your participation is voluntary. You may decide not to participate or to withdraw at any time without your current or future relations with Texas A&M University being affected. The records of this study will be kept private. No identifiers linking you to this study will be included in any sort of report that might be published. Research records will be stored securely and only Deanna Lovesmith, principal investigator, will have access to the records.
If you have questions regarding this study, you may contact Deanna Lovesmith, lovesmith@hot.rr.com.

This research study has been reviewed by the Human Subjects' Protection Program and/or the Institutional Review Board at Texas A&M University. For research-related problems or questions regarding your rights as a research participant, you can contact these offices at (979)458-4067 or irb@tamu.edu.

Please be sure you have read the above information, asked questions and received answers to your satisfaction. If you would like to participate in this study, please go to http://www.surveymonkey.com/s.aspx?sm=4_2bgL1WNxUauF6WDMOl7NSQ_3d_3d.
If you do not wish to participate, please go to
http://www.surveymonkey.com/optout.aspx?sm=4_2bgL1WNxUauF6WDMOl7NSQ_3d_3d .

Thank you for your time and participation,
Deanna Lovesmith
Texas A&M doctoral student

APPENDIX C

DATA RESPONSE TABLES

TABLE C-1. Superintendents' and Architects' Responses to Budget

Participant Code	Response
S11-15S1	The superintendent should share the district's philosophy about the "feel" that the building should present; the level of quality for long-term maintenance; the level of funding for aesthetic appeal both interior and exterior, the specifics of the function of the facility -- how it will be used; the specifics of the numbers of students / staff; ages and abilities of students; schedule; educational expectations / specs; and the level of involvement expected by other staff members.
S11-15S1	Architects should be familiar with the TEA standards; have relationships with high-quality consultants; have access to high performing facilities (to tour); understand engineering aspects and forces of nature (i.e. weight of units on roof; time-constraints of certain aspects of design, etc). Architect should respect the cost-estimates of builders and desires of owners.
S11-15S2	new and innovative approaches, programs that they might be familiar with, material choices and costs,
S11-15S3	Budget, educational programs and facilities standards
S11-15S3	Cost estimates, emerging trends, green standards, flow of foot traffic and minimum square footage standards from TEA
S16S65	Current design trends, environmental considerations, cost saving materials, quality of design, and creativity.
S1S66	needs and budget.
S1S67	The needs of the district and why you are building. Unfortunately you usually have to discuss how much money you have for a project and architects tend to design a building to use all the money you have.
S1S67	cost v. quality, options for value engineering prior to the plans being drawn to save on changes later.
S1S69	There is a myriad of ideas that come to mind, but obviously enrollment, personnel, special curricular needs, state requirements; safety concerns; student control issues; financial constraints; and community use, to name a few.
S1S69	As much as possible on the latest designs, materials, cost effectiveness studies, etc.
S1S70	How much money you feel the District can spend. How many students will be housed in the school. How much land is available to build. Timelines for building and completion.
S1S70	Cost of different building designs and materials.
S1S71	What you want (assuming that you know). Absolute price ceiling if you have one.
S1S72	Legal issues, state minimum requirements or recommendations, projected costs, best practices, experience
S1S73	Standards for ADA, costs, site location.
S1S74	Curriculum, building usage, community expectations, staff expectations, resources.
S1S74	Cost analysis of various designs, other recent projects cost, basic floor plan, projected cost to complete project.
S1S75	MONEY!!!! Sadly, that is what determines a project. I wish I could say it is the kids but money drives it all. :(
S1S76	What is possible and not possible --and to what extent it will alter the expense.

S1S77	Cost of construction, TEA requirements for school bldgs., building codes, projected utility costs, etc.
S1S78	Where new building(s) should be located, the cost of the building(s), what disruptions will construction entail, and guidance as to what are the most efficient and yet safe buildings.
S1S79	Amount of money to be spent. Description of the project.
S1S80	cost projections
S1S81	cost, bid info, choosing of a GC
S1S82	size, number of students, amount of money you have to spend
S1S82	Cost per foot, what type of materials will be used, future upkeep cost
S1S84	Types of classrooms, knowledge of special needs students, type of community (urban vs. suburban vs. rural), desires of the community, and funds we are working with for construction
S1S85	Different design concepts, cost implications, inflationary cost factors, Construction Market inhibitors
S1S86	Budget and number of students
S1S86	Feasibility and cost estimates
S1S88	Purpose of facility number of students and teachers to be served Specific activities that will take place in the facility Cost limits
S1S89	Anticipated size or enrollment, courses to be taught, anticipated growth (if any), budget available.
S1S93	How much of what I want and need can I get for the dollars I have available? How should I prioritize my needs and wants? What is new, efficient and cost effective for school that I may not have been aware of? Most importantly, I depend on the architect to make me aware of questions that need answers that I would have otherwise had knowledge of.
S1S94	The age and grade levels of students to be served. The anticipated maximum enrollment. Site, budgetary and political issues that might impact the design.
S2-5S11	Cost effectiveness, realistic size requirements, expandable, drainage, traffic flow
S2-5S14	Budget Capacity Any unique needs/requests If necessary to blend, stylistic ideas Schedule for need
S2-5S16	What the vision and the function of the school is going to be. The grade levels that will be in it and how much you are planning on spending
S2-5S16	cost, handicap requirements, ideas on how to maximize space and multi-use of that space
S2-5S17	The architect should be able to provide the school with ideas on how to provide those instructional spaces and should be able to help formulate costs for those areas.
S2-5S18	Expectations to architects should be clear regarding several issues: 1. Stewardship of tax dollars - not building an edifice to themselves. 2. The teachers are the ones that they need to work closely with in developing the ed specs - require several meetings per dept with architect.
S2-5S18	Typical information will relate to design alternatives and costs associated with those alternatives. In addition, code and ADA requirement guidance.
S2-5S20	Programming, budget, site features
S2-5S22	Programming--they are able to tell you what other schools are doing and what the costs will be for certain programs. They can also help with innovative design.
S2-5S23	Cost estimates Functionality Trends
S2-5S24	enrollment trends instructional needs budget
S2-5S25	cost options, new design ideas, cooperation
S2-5S27	state regs/standards costs estimates design

S2-5S29	Estimated budget Planned use of building Special features desired
S2-5S30	cost estimates for each segment of the building and each department. Most effective flow of pedestrian and vehicle traffic on site.
S2-5S33	Needs, as much about the scope of the overall project as possible, limits of financing available.
S2-5S33	approximate sq ft costs. Things that the school can do to limit costs. All fees associated with building, architect, engineering, civil, and utility hook up, etc.
S2-5S37	Expectations of the community, similarities/differences in the needs of this campus vs. other district campuses, budget limitations.
S2-5S37	Realistic budget numbers, variety of ideas.
S2-5S39	Cost estimates, feasibility of project, other statewide construction,
S2-5S40	demographics, instructional needs, anticipated budget available.
S2-5S40	Construction estimates, energy considerations, building trends,
S2-5S41	Current cost estimates, laws, codes, etc.
S2-5S42	The cost option of different products and its longevity. The cost to operate facility and future savings or replacement cost and prove the research and results are good. See sites that give the committee a better feel of what they want and need. Pictures and testimonial
S2-5S43	Suggested materials Overall concept Educational Specifications Cost Limitations
S2-5S43	Cost Functionality Common sizes Innovative ideas
S2-5S44	budget, amount of space (rooms) needed, area of land to build on, timeframe for project, general expectations.
S2-5S44	Ways to save money on utilities, design schemes, good use of space, movement throughout the building, ensure all codes are followed, etc.
S2-5S46	Cost per sq ft for various items wanted in project to determine whether affordable. I believe the plant should be planned around the instructional environment.
S2-5S47	condition of existing facilities enrollment forecasts amount of funds available space and program needs
S2-5S47	timelines for design and construction cost per square foot services provided by architect successes from other projects
S2-5S48	Start architect involvement when bond issue is being planned. Let them know exactly how much money you have to spend and that you want to get the most out of every penny spent. Have a working relationship so they know not to over plan or expect to overspend. Plan,Plan,Plan
S2-5S48	What can we get for the dollar that will meet the needs of the students, school, and community.
S2-5S49	cost per square foot - handicap requirements - utility issues -
S2-5S50	Current designs and materials and technologies that are effective in schools, cost saving measures, designs that enhance school safety
S2-5S51	Function, instructional needs, funds available, longevity, future uses of the facility, etc.
S2-5S52	Wants, needs, and money.
S2-5S52	Services offered, costs, design, prior experience.
S2-5S53	Regulations regarding classroom space requirements, cost, safety, etc. Architects are key to designing a school and provide a wealth of invaluable information.
S2-5S54	Who will be making decisions what is the budget demographic data special characteristics of the district

S2-5S54	cost per square foot construction delivery methods pro and cons cost of the design stage min. requirements (square footage for classes, science lab requirements, parking, etc..) timelines a good contract
S2-5S56	cost, alternatives, bidding procedures, experience with contractors, compliance with all laws, sound practices, liability issues, mechanical engineering advice, systems alternatives, projections, etc.
S2-5S57	Core Enrollment Purpose Budget
S2-5S57	Prior Costs Common Practices Design Options
S2-5S58	In addition to typical building costs, what will be the cost of maintenance of the building in the future (near and far) as well as the cost efficiency of the building.
S2-5S59	Recommendations on materials, cost estimates, input on what has worked best for them in past projects. Information from other designers for food service, media etc.
S2-5S60	budget, grade structure, enrollment numbers, instructional mission
S2-5S60	guidance throughout the process regarding everything from legal requirements to cost estimates
S2-5S62	Capacity, budget, level of students
S2-5S63	Costs, energy efficiency, school safety, specifications and manufactures for doors, locks, windows, furniture, etc.
S2-5S64	Creative ideas to meet the instructional desires of the district. Construction limitations, cost estimate limitations. Site necessities and site considerations. Future use considerations. How well will a building age? Capacity considerations.
S6-10S4	use size budget
S6-10S4	costs products building codes and options
S6-10S5	Design and function requirements, location issues, size, funds available.
S6-10S6	cost more effective and efficient approach to building utilities' savings as a result of prudent construction templates and ideas from other districts, jobs
S6-10S7	Grade configurations, program information, educational philosophy, work group requirements, budget, lot configuration.
S6-10S8	Cost efficiency and practical design.
S6-10S9	Current estimated cost per square foot of facilities in the surrounding area. What information they might have concerning the future of schools as well.
A16A33	1. sizes of spaces (area in sq. ft.) 2. budget info ($/s.f.) quality 3. overall cost 4. relationships of spaces
A16A14	TEA standards, rules and regulations for governmental entities, current (or future) construction costs, recent trends in school design solutions, ways to save money and time, facility design ideas that have demonstrated impact on educational outcomes
A16A20	Any applicable current trends in design or construction. The recommended construction methods and materials commensurate with the budget. Site limitations and implied design parameters.
A16A21	visual aids to understand the design, such as plans, elevations, sections, digital models, etc. Cost analysis. Space lists, adjacencies, alternate designs if cost or space is an issue.
A16A13	Student population solutions spatial solutions, program requirement solutions, Special needs solutions, guidance as to MEP solutions, Guidance in pursuing LEED certification, guidance on the socio-economic impact, cost and time line.
A6-10A43	scope, goals, budget

A16A25	no. of students, types of classes, desired size, budget, character, degree of safety, building codes
A16A1	CONSTRUCTION COSTS IMPACT , DESIGN PROCESS , LINE OF COMMUNICATIONS ,OWNER'S RESPONSIBILITIES , HOW THE OWNER CAN AFFECT THE SCHEDULE , THE IMPORTANCE OF TIMELY DECISIONS , ETC.
A16A10	Planning and design options and strategies, cost data, structural and finish level information
A16A16	Program Information on new trends in better learning environments Information on new trends in green architecture Cost trends Key challenges
A16A22	tea standards capacity studies of existing district facilities educational design trends code review cost estimate a design/program a project schedule
A16A23	tea standards capacity studies of existing district facilities educational design trends code review cost estimate a design/program a project schedule
A16A24	sf, cost, program of spaces
A16A3	Validation of the Program Design updates Cost information Design schedule updates
A16A32	current cost trends, current educational platforms, types of construction
A16A5	How instructional methods incorporated into the design, security elements incorporated into the design, square footage, information on who has been involved input with regards to HOT buttons, cost, success in meeting district standards.
A2-5A38	cost, ed programs, floor plans for example
A6-10A41	Construction Cost Data, New Learning Modules, Updated Codes, School examples
A6-10A42	Recommended program in response to stated educational objectives Cost estimates / forecasts
A16A4	Spatial Concepts that support better Learning Environments Cost per SF Review Budget Allocation Scenarios Optional Schemes & Concepts Renderings Schedule Proposal
A11-15A45	cost per sf and/or new building systems information
A16A31	when school needs to be opened size of student body location per demographic survey bond sale projection
A16A9	We need to understand the district's aspirations for teaching and learning. We need info on demographics and info on e1isting building configurations and conditions---facility assessment date. AND we need to know about district finances and bonding capacity. We also need to know about their technology systems and how their support teaching and learning.
A16A19	project parameters & information... how much & how many... scope, budget, schedule
A16A34	scope, budget, schedule, e1pectations for a successful project including systems
A16A9	You must start with a vision for teaching and learning---then define the scope, schedule and budgets for projects to support that vision.
A11-15A44	Budgetary parameters, schedule needs, educational goals, names of which district staff will have input or responsibility for which various issues, decision making process (i.e., what issues need school board input vs. staff input). General input about priorities, also what are "hot button issues" that may require special attention.
A11-15A44	Budget, schedule, guidance about overall master planning (the big picture more than just the particular project in question). Also, as much context as possible - i.e., comparisons to what other districts are doing in similar situations, what is currently standard and accepted good practice. Also, practical and regulatory constraints.

A16A12	Definitive space program, honest budgets, growth projections, school design standards, honest schedule e1pectations, owner support with school and administrative staff, all historical building information for a renovation.
A16A3	Budget Schedule Student Capacity Program Any initiative to incorporate design elements that support unique learning opportunities?
A16A7	Budget, schedule, curriculum, e1pected future growth, any specific e1pectations.
A16A4	Educational & Curricular Goals, or Specifications Community Stakeholders Design Review Process and Decision-Makers Other Strategic Goals to Achieve Construction Budget and What is Included/E1cluded Schedule Requirements Proposed Construction Delivery Process
A16A1	WE DESIGN SCHOOLS IN HUGE DISTRICTS AND SMALL SO WE GET VARIOUS INPUT FROM SUPER'S.....WE NEED SOLID BUDGETS , PARAMETERS , ISSUES THAT MUST BE ADDRESSED , STUDENT CAPACITIES , WHO WILL REP. THE DISTRICT , REALISTIC SCHEDULE AND PRIORITIES
A16A13	Educational goals, Educational philosophy, Mission statement, demographics inclusive of socio-economic data, special programs, participants in the design process, budget, time line, commitment to LEED certification.
A16A14	grade level configuration, school enrollment (initial and final anticipated), budget, district construction standards, educational specifications for sizes of rooms and included equipment or furniture, where, when
A16A17	We need real in depth concepts for how the district wants learning to work---and how they want to teach to realize that learning. Everything after that including a detailed program of requirements for design purposes, budget and schedule we can help the district define---BUT they must be clear about teaching and learning first--that is the base from which everything else springs.
A16A20	School budget, school population, school location/site, educational program, any particular problems that need addressing.
A16A27	budgets, latest research
A16A32	how education will be delivered, size of schools, organization of schools (department, small community), budgets
A11-15A46	life cycle of building usage
A16A26	state of the art status check related to school design (current trends, forward looking); current description of the design construction industry, current cost trends
A16A34	realistic schedule, budget and explanation of scope and systems
A2-5A38	priority spaces with funds available
A6-10A43	estimated cost, scope, scale appearance

TABLE C-2. Superintendents' and Architects' Responses to School Capacity

Participant Code	Response
S11-15S1	The superintendent should share the district's philosophy about the "feel" that the building should present; the level of quality for long-term maintenance; the level of funding for aesthetic appeal both interior and exterior, the specifics of the function of the facility -- how it will be used; the specifics of the numbers of students / staff; ages and abilities of students; schedule; educational expectations / specs; and the level of involvement expected by other staff members.
S11-15S2	the appropriate type classrooms, technology, an aesthetically pleasing environment
S11-15S3	adequate space in all learning environments, lighting considerations and Indoor Air Quality provisions
S1S67	minimum space issues are handled by state minimum requirements and they are adequate, however nothing in the minimum requirements cover technology which needs to be integrated into every classroom, adequate computer labs, distance learning room/s, etc.
S1S68	Student pop. Staff pop. Location, Academic areas to be addressed, Master schedule, community involvement with school, surrounding location
S1S68	how space in the school effects students, requirements of regulations, future planning
S1S69	There is a myriad of ideas that come to mind, but obviously enrollment, personnel, special curricular needs, state requirements; safety concerns; student control issues; financial constraints; and community use, to name a few.
S1S70	How much money you feel the District can spend. How many students will be housed in the school. How much land is available to build? Timelines for building and completion.
S1S71	Adequate space and comfort.
S1S72	Data--enrollment and projected enrollment Program information--what programs do we have now and what programs do we plan for the future
S1S72	This is a very broad question--- Technology (lots of technology), plenty of space for lots of learning and teaching methods, quality labs for science,
S1S73	Appropriate space, storage to avoid clutter, light, good traffic design.
S1S77	Projected enrollment for the next 5-10 years, curriculum concerns (such as science labs), current condition of existing facilities, community concerns about new construction (preferences).
S1S77	Ample classroom space, adequate lighting, an environment conducive for learning (colors, windows, wide hallways), security provisions, technology implementation.
S1S82	size, number of students, amount of money you have to spend
S1S86	Budget and number of students
S1S87	ADA requirements. Size requirements. Research based information on school design for best climate (lighting, colors, etc.).
S1S89	Anticipated size or enrollment, courses to be taught, anticipated growth (if any), budget available.
S1S89	Safety equipment/facility needs, planning factors such as minimal size for classrooms, labs, restrooms, ADA requirements, etc.
S1S90	1. TEA requirements 2. Allowance for future growth
S1S92	Student and faculty needs with regard to number of classrooms, size of classrooms, etc.

S1S94	The age and grade levels of students to be served. The anticipated maximum enrollment. Site, budgetary and political issues that might impact the design.
S2-5S11	1. No flat roof 2.Storage 3.Plenty of sq. footage 4.Know what a school should look like. Elem,jh,hs have different features and needs
S2-5S11	Cost effectiveness, realistic size requirements, expandable, drainage, traffic flow
S2-5S12	Everything we can afford so long as it matches the learning-teaching that goes on in the building.
S2-5S13	A program of requirements that details number of classrooms, unique attributes of specific areas, numbers of kids served, special programs, special local requirements such as district selected roofs, hardware, etc., community sense of structural attributes, i.e., will this school fit the community perception of schools, --- there are really too many items to detail here.
S2-5S15	age and size of occupants of the building
S2-5S15	room size and facilities conducive to support science, band, fine arts, library area
S2-5S16	What the vision and the function of the school is going to be. The grade levels that will be in it and how much you are planning on spending
S2-5S16	cost, handicap requirements, ideas on how to maximize space and multi-use of that space
S2-5S17	Enrollment projections and planned programs for the school are musts. New schools must be able to provide the needed spaces for the instructional programs that will be provided at the campus. The school must not have portable buildings so after it is opened.
S2-5S18	All of the facility should, in some way, directly or indirectly support student learning. In addition to the needed square footage per student, technology needs, lab requirement needs, etc. down to the width of the hallways plays a supporting role. Example: If the hallways are too narrow, then conflicts increase and the attention of the students is drawn from their classroom activities to hallway activities. Color schemes also play a role in supporting learning.
S2-5S22	libraries, gym, open areas for large group instruction, natural light, adequate sized classrooms, spaces that are easily cleaned
S2-5S23	Capacity in # of students. Grade levels Programs within school Past construction history of present buildings Plan for future construction
S2-5S23	Computer labs Adequate space Academics separated from extracurricular
S2-5S24	enrollment trends instructional needs budget
S2-5S24	adequate space technology lighting safety
S2-5S26	Levels taught, special needs or programs on the campus. Number of students and classrooms needed. Expected growth or declines. Science taught (labs needed), extracurricular areas, access needs or concerns, safety needs or concerns.
S2-5S27	classroom size electrical capacity storage technology
S2-5S28	non-negotiable items, general desires regarding specific items (flooring, wall board, square footage, etc., etc.) number of students served
S2-5S30	Student population, curriculum, future needs
S2-5S31	Technology and adequate space to enhance comfort of the learner.
S2-5S32	number of students to serve, programs to be included, quality of materials to use for construction
S2-5S32	State and local building code requirements, state space requirements
S2-5S32	classroom space, technology labs, physical education space
S2-5S34	everything from class size to details of classroom configurations

S2-5S34	in this day we need several smaller rooms or divided rooms other than regular classrooms to accommodate special programs with smaller student: teacher ratios. There are many components that are critical but relative to what grade level you are planning and designing
S2-5S36	Size and student age
S2-5S38	1. Completion time line 2. Projective enrollment 3. Any special needs 4. Core capacity
S2-5S38	The colors of the class rooms, natural light entering the classroom and enough space.
S2-5S43	Flexibility Adequate power, lighting, technology Adequate space Durable materials
S2-5S45	Specifics about who and how many will populate the building, any special needs or uses, community expectations on building appeal and cost.
S2-5S45	state and local code requirements, experience in student utility efficiency
S2-5S45	space for growth, latest technology, availability for community use
S2-5S46	Age of student type of instructional strategies utilized Technology utilized goals of district
S2-5S47	condition of existing facilities enrollment forecasts amount of funds available space and program needs
S2-5S47	adequate square footage in classrooms adequate space for special programs adequate space for support functions (admin, counselor, nurse, etc.) designed to utilize technology energy efficient design
S2-5S48	Technology, facilities that meet the needs of the students and teachers at that school level, ADA,
S2-5S49	potential locations - number of students to serve - curriculum or course requirements - utility issues - past history of construction issues -
S2-5S49	classrooms - restrooms - offices - technology - security cameras - good lighting - pleasant colors - communication systems
S2-5S52	Classroom space and technology infrastructure
S2-5S53	Enrollment, Number of Teachers, Types of Programs such as electives, Student participation in extracurricular programs. Number of administrators and support staff. You also need to tell them what style of school you want to have, what style of architecture, etc. Where the location will be is also an important decision since it impacts design.
S2-5S53	Technology, large classrooms, adequate labs and support areas, library, cafeteria, gym, everything about a school should support student learning.
S2-5S54	technology infrastructure, security systems, capacity for growth, attention to lighting, fixtures and hardware. design should be specific for a school and not just and office building e.g. hygiene and cleaning issues. environmental issues
S2-5S55	Population to be served...grade levels. Expectation of the type of construction wanted.
S2-5S55	Office space, nurse area, classrooms, computer labs, library and other areas required, depending on the grade levels, such as, band hall, chemistry/biology labs and etc. should be included.

S2-5S56	Storage, infrastructure for technology. Updated phone, paging, alarms. Room size to support desks and computer stations. Labs for science. Conference room to be used for Art's, department meetings, administrative meetings, etc. Build for growth. Adaptable. Hallways that can be monitored from administration offices. Access to public through one door. Landscaping that does not affect foundation or limit view to the building. Use of sunlight in halls. Outdoor lighting that shines on the building, that keeps the crickets and other bugs away from building at night. Conservation of water, electricity through timers, programmable thermostats, motion detectors, auto flush, etc. Ease of maintenance in high traffic areas like bathrooms and classroom/hall floors. Parking. Access to building on sidewalks to limit mud and grime. Thought to lockers or no. Plenty of room for circulation of students. Thought on layout of classrooms to facilitate class change. Central office at main entrance, with view of halls. Bathroom facilities for staff. Air dryers for hands. Systems that are easy to train to use and maintain and find parts for.
S2-5S57	Core Enrollment Purpose Budget
S2-5S59	Technology, library/media center with adequate space, open areas built into building for informal meeting spaces
S2-5S60	budget, grade structure, enrollment numbers, instructional mission
S2-5S61	The number of students, programs, future district growth and district expectations.
S2-5S62	Capacity, budget, level of students
S2-5S63	Current student enrollment and future projections. State minimum square foot requirements and the district desired minimum square foot requirements. Energy and electrical as well as computer wiring and wireless access points. Hallway width, window size and insulation specifications. Metal standing seam roof with split face block outer construction. Needs assessment of staff and their involvement in the design process.
S2-5S63	Proper square footage and full technology infrastructure(projectors, screens, central unit for teacher laptop and student furniture to accommodate 1 to 1 laptop initiative, computer laboratories, science laboratories, community type library,
S2-5S64	Creative ideas to meet the instructional desires of the district. Construction limitations, cost estimate limitations. Site necessities and site considerations. Future use considerations. How well will a building age? Capacity considerations.
S2-5S64	From my perspective: Adequate classroom size and equipment, including technology. Appropriate restrooms, hallway spaces, or "student space". A resource center or library that can be flexible as technology changes. Current technology equipment and adequate space for future needs. Administrative and maintenance spaces. Adequate exterior parking, staging and traffic management.
S6-10S10	Number of classrooms, counters, computer labs, restrooms, teacher storage areas, windows (yes or no) air-condition units, maintenance issues discussed before the planning phase, utility cut off areas, intercom systems, alarm systems, fire alarm systems, etc. and many more items......
S6-10S4	use size budget
S6-10S5	Design and function requirements, location issues, size, funds available.
S6-10S7	Grade configurations, program information, educational philosophy, work group requirements, budget, lot configuration.
S6-10S8	Space, storage and technology. See recommendations by Ian Jukes. Ian is a futurist who promotes technology and architecture. Currently writing a book in conjunction with a Houston architect.
S6-10S9	Need to provide a vision of what education will look like in the future, not today. Capacity of the school, programs that will be included in the school

A16A14	grade level configuration, school enrollment (initial and final anticipated), budget, district construction standards, educational specifications for sizes of rooms and included equipment or furniture, where, when
A16A10	School district needs to provide enrollment projections, curriculum requirements, instructional principals, site data, etc.
A16A7	Budget, schedule, curriculum, e1pected future growth, any specific e1pectations.
A16A23	educational concepts grade alignment information enrollment information surveys
A16A31	when school needs to be opened size of student body location per demographic survey bond sale projection
A16A1	WE DESIGN SCHOOLS IN HUGE DISTRICTS AND SMALL SO WE GET VARIOUS INPUT FROM SUPER'S .....WE NEED SOLID BUDGETS , PARAMETERS , ISSUES THAT MUST BE ADDRESSED , STUDENT CAPACITIES , WHO WILL REP. THE DISTRICT , REALISTIC SCHEDULE AND PRIORITIES
A16A11	Demographics are usually very critical. We look at the number of families expected to move in the area and determine size and scope based on the future growth expectations. Most school districts also provide certain design standards or criteria for the district. Some districts are more extensive than others. This is mostly for reduction in future maintenance cost. If items specified are of similar make and model, it is very affordable to stock pile needed repair items.
A16A13	Educational goals, Educational philosophy, Mission statement, demographics inclusive of socio-economic data, special programs, participants in the design process, budget, time line, commitment to LEED certification.
A16A19	project parameters & information... how much & how many... scope, budget, schedule
A16A20	School budget, school population, school location/site, educational program, any particular problems that need addressing.
A16A22	educational concepts grade alignment information enrollment information surveys
A16A25	no. of students, types of classes, desired size, budget, character, degree of safety, building codes
A16A3	Budget Schedule Student Capacity Program Any initiative to incorporate design elements that support unique learning opportunities?
A16A30	# of student population, classroom periods per day, pedagogy, teaching methodology, vision for the function and aesthetics of the building
A16A32	how education will be delivered, size of schools, organization of schools (department, small community), budgets
A16A5	Grade level information, capacity, instructional method desired by the District at the campus, District Technology requirements, Program of Spaces if available, site information.
A16A8	Instructional philosophy, capacity, grade alignments, curicular requirements, demographic, special needs population, federal program qualifications etc.
A2-5A36	-What teaching methods are used (pod, cluster, etc) -Special Needs or programs of the district -Master Plan -Things that work and things that don't in the e1isting schools -program

TABLE C-3. Superintendents' and Architects' Responses to Technology

Participant Code	Response
S11-15S2	the appropriate type classrooms, technology, an aesthetically pleasing environment
S1S67	minimum space issues are handled by state minimum requirements and they are adequate, however nothing in the minimum requirements cover technology which needs to be integrated into every classroom, adequate computer labs, distance learning room/s, etc.
S1S70	Classroom, science labs, technology labs, art rooms, fine arts building.
S1S72	This is a very broad question--- Technology (lots of technology), plenty of space for lots of learning and teaching methods, quality labs for science,
S1S77	Ample classroom space, adequate lighting, an environment conducive for learning (colors, windows, wide hallways), security provisions, technology implementation.
S1S78	Science labs, computer access and computer labs, libraries or media centers and plans that are conducive to ensuring students feel safe.
S1S80	wireless technology capabilities adequate numbers of classrooms to prevent overcrowding in the future media center
S1S82	Comfortable setting, tech support, ease of student movement
S1S87	Technology, hands on labs, traditional teaching area.
S1S89	technology, light, safety
S1S90	1. Technology 2. Friendly, welcoming atmosphere
S1S91	technology learning spaces that have natural light
S1S92	Academic computer lab in addition to labs used for classes, library with up-to-the-date multimedia capabilities, adequate science labs, academic counseling center.
S1S94	All the available resources a district can afford to provide for the programming needs of the facility. Flexibility to adapt to new technologies, accessibility for the public, easily maintained to high standards, safety and security.
S2-5S11	Air quality, ventilation, windows, plenty of labs, computer accessible in each area of the building
S2-5S12	Technology; fencing; cameras; the building should be a unit without needing to go outside; clearly visible lines in corridors, etc.
S2-5S14	Library/electronic access for all classrooms students/large group meeting/security issues/Gyms etc.
S2-5S17	Classrooms with technology are a must.
S2-5S18	All of the facility should, in some way, directly or indirectly support student learning. In addition to the needed square footage per student, technology needs, lab requirement needs, etc. down to the width of the hallways plays a supporting role. Example: If the hallways are too narrow, then conflicts increase and the attention of the students is drawn from their classroom activities to hallway activities. Color schemes also play a role in supporting learning.
S2-5S20	Technology, spacious classrooms, quality science labs, effective library,
S2-5S21	traditional layout wireless internet access for anywhere anytime learning
S2-5S23	Computer labs Adequate space Academics separated from extracurricular
S2-5S24	adequate space technology lighting safety

S2-5S25	technology available in classroom (teacher laptop, presentation station, smart board, etc), technology and media center, adequate lab space, large enough classrooms, space for student programs (CATE, dance, gyms for sports, etc)
S2-5S27	latest technology set up of campus library
S2-5S27	classroom size electrical capacity storage technology
S2-5S28	Internet drops, wireless internet, smart boards, space,
S2-5S29	Computer labs Distance learning facility Athletic complex Library Safety features
S2-5S30	technology, large media center
S2-5S31	Technology and adequate space to enhance comfort of the learner.
S2-5S32	classroom space, technology labs, physical education space
S2-5S33	the ability to monitor and administer student learning as efficiently as possible. Technology needs should be considered, but long term debt for short term needs is not a good idea for poor districts in my opinion. Paying for items that will be outdated and outsourced after 5 years over 30 does not make a lot of sense. The design should make the students want to learn, be aesthetically pleasing while serving its purpose.
S2-5S40	Technology considerations, energy efficiency
S2-5S41	Technology infrastructure......
S2-5S42	The facility needs to be each to maintain, appealing and conducive to a good proven researched based learning environment. Set up to meet future trends of technology and other creative digital learning medias.
S2-5S43	Flexibility Adequate power, lighting, technology Adequate space Durable materials
S2-5S45	space for growth, latest technology, availability for community use
S2-5S46	Age of student type of instructional strategies utilized Technology utilized goals of district
S2-5S47	adequate square footage in classrooms adequate space for special programs adequate space for support functions (admin, counselor, nurse, etc.) designed to utilize technology energy efficient design
S2-5S48	Technology, facilities that meet the needs of the students and teachers at that school level, ADA,
S2-5S49	classrooms - restrooms - offices - technology - security cameras - good lighting - pleasant colors - communication systems
S2-5S50	Comfortable and safe surrounds, adequate electrical and technology support (including classroom computer centers), areas for teacher and student collaboration, area for parent and teacher meetings, etc.
S2-5S50	Previous building and utility plans, building/classroom usage plans, budgetary expectations, input from campus and district improvement committees, desired materials, technology needs,
S2-5S52	Classroom space and technology infrastructure
S2-5S53	Technology, large classrooms, adequate labs and support areas, library, cafeteria, gym, everything about a school should support student learning.
S2-5S54	technology infrastructure, security systems, capacity for growth, attention to lighting, fixtures and hardware. Design should be specific for a school and not just and office building e.g. hygiene and cleaning issues. environmental issues
S2-5S55	Office space, nurse area, classrooms, computer labs, library and other areas required, depending on the grade levels, such as, band hall, chemistry/biology labs and etc. should be included.

S2-5S56	Storage, infrastructure for technology. Updated phone, paging, alarms. Room size to support desks and computer stations. Labs for science. Conference room to be used for ARD's, department meetings, administrative meetings, etc. Build for growth. Adaptable. Hallways that can be monitored from administration offices. Access to public through one door. Landscaping that does not affect foundation or limit view to the building. Use of sunlight in halls. Outdoor lighting that shines on the building, that keeps the crickets and other bugs away from building at night. Conservation of water, electricity through timers, programmable thermostats, motion detectors, auto flush, etc. Ease of maintenance in high traffic areas like bathrooms and classroom/hall floors. Parking. Access to building on sidewalks to limit mud and grime. Thought to lockers or no. Plenty of room for circulation of students. Thought on layout of classrooms to facilitate class change. Central office at main entrance, with view of halls. Bathroom facilities for staff. Air dryers for hands. Systems that are easy to train to use and maintain and find parts for.
S2-5S57	New technology Cameras Fencing Roadway improvements
S2-5S59	Technology, library/media center with adequate space, open areas built into building for informal meeting spaces
S2-5S59	Programming, technology, needs for various rooms, water, network, etc. input on areas for bus and parent pickup, preferred materials for hallway covering, flooring, preferences for mechanical systems
S2-5S61	Library(learning center), gym, computer hook ups to accommodate classroom small groups and classrooms for labs, teacher workrooms, teacher space for peer interaction, conference rooms, phones for teacher/parent contact, rooms for specials and support staff.
S2-5S62	safety, security, lighting, state of the art technology,
S2-5S63	Proper square footage and full technology infrastructure(projectors, screens, central unit for teacher laptop and student furniture to accommodate 1 to 1 laptop initiative, computer laboratories, science laboratories, community type library,
S2-5S63	Current student enrollment and future projections. State minimum square foot requirements and the district desired minimum square foot requirements. Energy and electrical as well as computer wiring and wireless access points. Hallway width, window size and insulation specifications. Metal standing seam roof with split face block outer construction. Needs assessment of staff and their involvement in the design process.
S2-5S64	From my perspective: Adequate classroom size and equipment, including technology. Appropriate restrooms, hallway spaces, or "student space". A resource center or library that can be flexible as technology changes. Current technology equipment and adequate space for future needs. Administrative and maintenance spaces. Adequate exterior parking, staging and traffic management.
S2-5S64	Technology. Design of student/staff movement through the building during the day and after hours. Use of building during non-school time. Effective communication systems throughout the building. Parking lots designed for traffic and pedestrian movement.
S2-5S64	All programming information. How instruction is provided to students at the school. How the school will be administered. Technology expectations. Classroom instructional methods/strategies. Security expectations. Energy use expectations. Local boards must provide any specific expectations to the architect prior to planning (conventional cooling systems vs. geothermal systems, local providers).
S6-10S10	Technology, classroom structure identifying the layout of the classroom and spatial considerations, lighting, floor design, color schemes, ventilation systems that allow a high flow of oxygen into the classrooms, noise levels, (chalk boards, white boards, smart boards or other), phones in the classrooms yes or no, security issues, etc.

S6-10S4	advanced technology and communication tools also safety issues addressed
S6-10S7	Flexible spaces, technology, collaborative areas, all spaces, including outdoors, can be used for learning, green concepts.
S6-10S8	Space, storage and technology. See recommendations by Ian Jukes. Ian is a futurist who promotes technology and architecture. Currently writing a book in conjunction with a Houston architect.
A11-15A45	technology, natural lighting
A11-15A46	support to technology design
A16A13	Social/Cultural receptive environments, proper lighting preferably natural, more than adequate HVAC, flexible space, secure environments, technology flexible environment, ease of adaptability and visually stimulating.
A16A16	daylighting flexible learning spaces technology support buildings that teach durable materials green materials
A16A17	We must teach individual students (regardless of age), strive for successful outcomes for each student. We must prepare kids for the future using teaching methods appropriate to them. That means that technology must be a tool, an integral part of instruction. Every teacher and every student must have their own digital device---BUT teachers must learn to use them effectively for instruction---they need to catch up with the kids they are teaching. We must focus on higher order thinking skills, problem solving and communication skills in addition to content/knowledge skills. We must have school highly flexible so that they can constantly change in response to the changes happening in the world around them. Egg-crate schools will not work in the future. We must connect schools to the real world so that students can see the relevance of their work and teachers can stay abreast of the world for which they are preparing students. We need to make time flexible for that it can serve individual learning styles. Students learn in different ways at different paces. The school days should not be divided into fixed periods for secondary students. There should be some flexible time every day for both kids and teachers. Schooling should be a continuous service, not a timed, seasonal event. Kids should be able to learn anytime, anywhere---not just sitting in rows in a teacher's room. Students should have a place to work in schools. They should not move from teachers space to teachers space all day with only their back packs. They should have some place to call their own and real opportunities to use them. Kids of every age need close meaningful regular substantial support form one or more adults. Shuffling kids from class to class does not accomplish this at all.
A16A19	All programmatic spaces, plus the reinforcement of casual small group interaction. Building systems (especially technology systems) must support the educational program.
A16A21	accessibility, good acoustics in learning environment, enhanced audio in the classroom. access to computers in every classroom for students. Teacher computer connected to digital projector. Natural lighting. Multifunctional / flexible teaching spaces. Smaller public spaces that encourage social gathering.
A16A22	technology flexibility large group instruction spaces activity areas science labs learning media center classrooms (the correct # and size) computer labs
A16A23	technology flexibility large group instruction spaces activity areas science labs learning media computer labs center classrooms (the correct # and size)
A16A25	safe environment, technology, daylight in classrooms
A16A27	natural light, acoustics (good), reflective surfaces, latest technology, indoor air quality
A16A28	technology healthy environments meeting places
A16A29	flex spaces, wireless communities

A16A31	daylighting flexible configuration technology career education lessons learned from prior schools and departments current instructional curriculum direction
A16A5	Variety of sizes of spaces that support a variety of learning abilities, providing proper lighting, acoustical and air quality, technology, natural lighting.
A6-10A41	Technology, Smaller learning areas,
A6-10A42	Daylighting Informal spaces for group work one computer for each student - laptop work areas for teachers with desk / computer separate from classroom so that students can more often stay put and TEACHERS move from class to class after hours access to resources in library between close of school day and 6 pm safe after school program with learning centered activities including homework assistance and work area for self directed homework activities
A6-10A43	appropriate space, safe environment, appropriate technology

TABLE C-4. Superintendents' and Architects' Responses to Superintendent as Communicator

Participant Code	Response
S11-15S1	The superintendent should share the district's philosophy about the "feel" that the building should present; the level of quality for long-term maintenance; the level of funding for aesthetic appeal both interior and exterior, the specifics of the function of the facility -- how it will be used; the specifics of the numbers of students / staff; ages and abilities of students; schedule; educational expectations / specs; and the level of involvement expected by other staff members.
S16S65	Educational specifications for the facility with a vision for your expectations for the building design.
S1S66	needs and budget.
S1S67	The needs of the district and why you are building. Unfortunately you usually have to discuss how much money you have for a project and architects tend to design a building to use all the money you have.
S1S68	Student pop. Staff pop. Location, Academic areas to be addressed, Master schedule, community involvement with school, surrounding location
S1S69	There is a myriad of ideas that come to mind, but obviously enrollment, personnel, special curricular needs, state requirements; safety concerns; student control issues; financial constraints; and community use, to name a few.
S1S71	What you want (assuming that you know). Absolute price ceiling if you have one.
S1S73	What specifics you require such as roof type and style, # of classrooms, uses, community expectations.
S1S74	Curriculum, building usage, community expectations, staff expectations, resources.
S1S76	We told ours everything possible -- even to the smallest details of how doors opened --we then reviewed preliminary sketches before the actual formation of the actual plans.
S1S77	Projected enrollment for the next 5-10 years, curriculum concerns (such as science labs), current condition of existing facilities, community concerns about new construction (preferences).
S1S78	What the needs of the community and school district are.
S1S83	A clear picture of what is envisioned such as photos from other schools, the community's expectations, and the educational philosophy behind the design.
S1S84	Types of classrooms, knowledge of special needs students, type of community (urban vs. suburban vs. rural), desires of the community, and funds we are working with for construction
S1S85	The long term educational expectation of the school district. Instructional philosophy in terms of classroom design and location. "School within a School concepts, etc."
S1S87	Vision of school. Future projections (student population). Philosophy of school (recreation areas, student gathering places, transition issues, lockers, etc)

S2-5S13	A program of requirements that details number of classrooms, unique attributes of specific areas, numbers of kids served, special programs, special local requirements such as district selected roofs, hardware, etc., community sense of structural attributes, i.e., will this school fit the community perception of schools, --- there are really too many items to detail here.
S2-5S16	What the vision and the function of the school is going to be. The grade levels that will be in it and how much you are planning on spending
S2-5S19	Specific needs of the district. Building specifications are extremely important. You must list exactly what is desired for your district.
S2-5S21	general design use layout vision
S2-5S22	Your expectations for how the campus will serve students, teachers, and community.
S2-5S31	The general wishes of the staff and board should be the first information the architect receives.
S2-5S33	Needs, as much about the scope of the overall project as possible, limits of financing available.
S2-5S35	Wants and Needs of the key players
S2-5S37	Expectations of the community, similarities/differences in the needs of this campus vs. other district campuses, budget limitations.
S2-5S38	1. Completion time line 2. Projective enrollment 3. Any special needs 4. Core capacity
S2-5S39	Educational need, space desires, special needs to your district, community standards, past history.
S2-5S41	Information pertaining to what you wish to build or remodel (number of proposed classrooms, specialty labs, gyms, etc...)
S2-5S42	The issues each school district needs to address ex. high traffic areas such gym school entries, dressing facilities, traffic control, additional future growth and expansion and technology needs in future.
S2-5S44	budget, amount of space (rooms) needed, area of land to build on, timeframe for project, general expectations.
S2-5S45	Specifics about who and how many will populate the building, any special needs or uses, community expectations on building appeal and cost.
S2-5S46	Age of student type of instructional strategies utilized Technology utilized goals of district
S2-5S47	condition of existing facilities enrollment forecasts amount of funds available space and program needs
S2-5S48	What can we get for the dollar that will meet the needs of the students, school, and community?
S2-5S50	Previous building and utility plans, building/classroom usage plans, budgetary expectations, input from campus and district improvement committees, desired materials, technology needs,
S2-5S52	Wants, needs, and money.
S2-5S53	Enrollment, Number of Teachers, Types of Programs such as electives, Student participation in extracurricular programs. Number of administrators and support staff. You also need to tell them what style of school you want to have, what style of architecture, etc. Where the location will be is also an important decision since it impacts design.
S2-5S54	Who will be making decisions what is the budget demographic data special characteristics of the district
S2-5S55	Population to be served...grade levels. Expectation of the type of construction wanted.

S2-5S56	Purpose of building, circulation of students, security (fire, theft, communication, etc.), impact on community, "big picture" of what community/board/teachers expect. Set out parameters that can take input of community/board/teachers such as carpet or tile, lockers or no, paint/color schemes, etc. Building orientation for bus, auto, parking, other buildings. Future plans. Work order changes.
S2-5S57	Core Enrollment Purpose Budget
S2-5S61	The number of students, programs, future district growth and district expectations.
S2-5S63	Current student enrollment and future projections. State minimum square foot requirements and the district desired minimum square foot requirements. Energy and electrical as well as computer wiring and wireless access points. Hallway width, window size and insulation specifications. Metal standing seam roof with split face block outer construction. Needs assessment of staff and their involvement in the design process.
S6-10S6	vision Board's parameters if possible, a footprint
S6-10S7	Vision and philosophy, examples and schematics, renderings of possible solutions based on school vision. Much of this can be accomplished in a Charette Process.
S6-10S8	Architects should listen to the needs of the community and not try to build a monument.
S6-10S9	Need to provide a vision of what education will look like in the future, not today. Capacity of the school, programs that will be included in the school
S6-10S9	Current estimated cost per square foot of facilities in the surrounding area. What information they might have concerning the future of schools as well.
A11-15A44	Budgetary parameters, schedule needs, educational goals, names of which district staff will have input or responsibility for which various issues, decision making process (i.e., what issues need school board input vs. staff input). General input about priorities, also what are "hot button issues" that may require special attention.
A11-15A45	the district's vision and latest educational trends impacting the facilities
A16A1	WE DESIGN SCHOOLS IN HUGE DISTRICTS AND SMALL SO WE GET VARIOUS INPUT FROM SUPER'S .....WE NEED SOLID BUDGETS , PARAMETERS , ISSUES THAT MUST BE ADDRESSED , STUDENT CAPACITIES , WHO WILL REP. THE DISTRICT , REALISTIC SCHEDULE AND PRIORITIES
A16A12	Definitive space program, honest budgets, growth projections, school design standards, honest schedule e1pectations, owner support with school and administrative staff, all historical building information for a renovation.
A16A16	Long-term district goals Educational philosophy and approach Curriculum Financial challenges Operations and maintenance approach Special needs/desires of the community Program Site
A16A17	We need real in depth concepts for how the district wants learning to work---and how they want to teach to realize that learning. Everything after that including a detailed program of requirements for design purposes, budget and schedule we can help the district define---BUT they must be clear about teaching and learning first--that is the base from which everything else springs.

A16A18	Most of our school district clients are small "single high school feeder" districts of 4a or smaller. The best leadership comes from superintendents who are collaborative leaders. The best input comes from those who clearly layout boundaries to their staff and let them be involved in the design process. The most important role a superintendent can play is that of the conduit to the public. Intelligent selection of community leaders in prebond planning, picking good internal and e1ternal leadership is critical to a bond program's success. No one else is positioned to play this role. Superintendents are often less effective in "micro-managing" the details of the actual design than in "articulating the vision" laying out the strategy for the public relations. Without a successful election, there will be no new schools.
A16A19	project parameters & information... how much & how many... scope, budget, schedule
A16A2	The school superintendent or his appointed employee is the key contact person for an architect. The architect must have a good relationship with this contact person so that e1cellent involvement by the district and coordination of contact with the district can be achieved.
A16A20	School budget, school population, school location/site, educational program, any particular problems that need addressing.
A16A21	The superintendent should have a leadership role in planning schools. He/she should set the expectations of the district. The superintendent should assemble other users to be part of the process also.
A16A24	general direction on school and support from curriculum as much involvement as desired
A16A26	honest description of expectations, candid outline of unstated criteria
A16A3	Budget Schedule Student Capacity Program Any initiative to incorporate design elements that support unique learning opportunities?
A16A30	# of student population, classroom periods per day, pedagogy, teaching methodology, vision for the function and aesthetics of the building
A16A34	scope, budget, schedule, e1pectations for a successful project including systems
A16A4	Educational & Curricular Goals, or Specifications Community Stakeholders Design Review Process and Decision-Makers Other Strategic Goals to Achieve Construction Budget and What is Included/Excluded Schedule Requirements Proposed Construction Delivery Process
A16A7	Budget, schedule, curriculum, expected future growth, any specific expectations.
A2-5A37	heavy leadership with school staff helping them understand the importance of planning ... not just getting a new school
A6-10A40	We usually get the information we need from facilities departments and administrators at the unique schools we work at, not the superintendant. I think it is more important for the superintendant to disseminate information to these individuals and not spend time directly with architects, unless it is a VERY small district and their time is not needed elsewhere, as it usually is.

TABLE C-5. Superintendents' and Architects' Responses to Design Trends

Participant code	Response
S11-15S1	The superintendent should share the district's philosophy about the "feel" that the building should present; the level of quality for long-term maintenance; the level of funding for aesthetic appeal both interior and exterior, the specifics of the function of the facility -- how it will be used; the specifics of the numbers of students / staff; ages and abilities of students; schedule; educational expectations / specs; and the level of involvement expected by other staff members.
S11-15S2	new and innovative approaches, programs that they might be familiar with, material choices and costs,
S11-15S3	Cost estimates, emerging trends, green standards, flow of foot traffic and minimum square footage standards from TEA
S16S65	Current design trends, environmental considerations, cost saving materials, quality of design, and creativity.
S1S69	As much as possible on the latest designs, materials, cost effectiveness studies, etc.
S1S72	Legal issues, state minimum requirements or recommendations, projected costs, best practices, experience
S1S76	What is possible and not possible --and to what extent it will alter the expense.
S1S79	creativity of designing the project.
S1S80	Information necessary to build a building to best meet the needs of the students that the current building could not meet - extra storage, hallway and classroom and common room placement to correct student traffic pattern problems, science lab layouts, etc. Teacher input is critical when making suggestions.
S1S83	A clear picture of what is envisioned such as photos from other schools, the community's expectations, and the educational philosophy behind the design.
S1S84	Choices, lots of choices. I also want to see the actual building or structure. So "field trips" would be one of my needs.
S1S85	Different design concepts, cost implications, inflationary cost factors, Construction Market inhibitors
S1S87	ADA requirements. Size requirements. Research based information on school design for best climate (lighting, colors, etc.).
S1S88	Ideas on solutions to problems experienced in existing facilities What are other schools doing to solve specific problems? What are the most current ideas and concepts in design and function?
S1S91	Learn from all of their mistakes and meet all ADA laws
S1S92	ADA requirements, other legal requirements such as local utility and fire codes, descriptions of innovative designs in other districts, etc.

S1S93	How much of what I want and need can I get for the dollars I have available? How should I prioritize my needs and wants? What is new, efficient and cost effective for school that I may not have been aware of? Most importantly, I depend on the architect to make me aware of questions that need answers that I would have otherwise had knowledge of.
S1S94	Moderate the extreme nature of stakeholder requests and ideas. Practicality and maintainability of design ideas from stakeholders. Emerging trends that will make the building as flexible as possible for the generations of use anticipated.
S2-5S11	Cost effectiveness, realistic size requirements, expandable, drainage, traffic flow
S2-5S12	Our ideas are paramount; their ideas are important; provide options; no grandstanding; do not expect accolades for the district or the profession; look out for interests and well-being not yours.
S2-5S19	What are the most efficient and effective solutions to building your project. What things have they had success in the past using. A good list of references.
S2-5S20	New trends, technology changes, budget estimates, materials to be used
S2-5S21	general design use layout vision
S2-5S22	Programming--they are able to tell you what other schools are doing and what the costs will be for certain programs. They can also help with innovative design.
S2-5S23	Cost estimates Functionality Trends
S2-5S24	All information that is relevant to the building being properly designed. Especially aspects of design that they are aware that a person not familiar with construction would understand.
S2-5S25	cost options, new design ideas, cooperation
S2-5S26	Energy efficient options and building options for cost management that maximize safety, efficiency, and effectiveness. Engineering advice and input on design to meet current and future needs from an architectural to educational stand point.
S2-5S30	cost estimates for each segment of the building and each department. Most effective flow of pedestrian and vehicle traffic on site.
S2-5S33	approximate sq ft costs. Things that the school can do to limit costs. All fees associated with building, architect, engineering, civil, and utility hook up, etc.
S2-5S42	The cost option of different products and its longevity. The cost to operate facility and future savings or replacement cost and prove the research and results are good. See sites that give the committee a better feel of what they want and need. Pictures and testimonial
S2-5S43	Cost Functionality Common sizes Innovative ideas
S2-5S44	Ways to save money on utilities, design schemes, good use of space, movement throughout the building, ensure all codes are followed, etc.
S2-5S50	Current designs and materials and technologies that are effective in schools, cost saving measures, designs that enhance school safety
S2-5S55	What are most efficient designs as far as maintenance, operation and upkeep is concern.

S2-5S56	cost, alternatives, bidding procedures, experience with contractors, compliance with all laws, sound practices, liability issues, mechanical engineering advice, systems alternatives, projections, etc.
S2-5S57	Prior Costs Common Practices Design Options
S2-5S59	Recommendations on materials, cost estimates, input on what has worked best for them in past projects. Information from other designers for food service, media etc.
S2-5S61	Tea requirements for space. Suggestions as to how a campus could be configured. Pick up and delivery of students and how smooth flow of parents and students during high traffic times.
S6-10S10	present more than one design option so that the staff and board has input into what is going to be done.
S6-10S6	cost more effective and efficient approach to building utilities' savings as a result of prudent construction templates and ideas from other districts, jobs
S6-10S7	Vision and philosophy, examples and schematics, renderings of possible solutions based on school vision. Much of this can be accomplished in a Charente Process.
A11-15A44	Budget, schedule, guidance about overall master planning (the big picture more than just the particular project in question). Also, as much context as possible - i.e., comparisons to what other districts are doing in similar situations, what is currently standard and accepted good practice. Also, practical and regulatory constraints.
A11-15A45	cost per sf and/or new building systems information
A16A10	Planning and design options and strategies, cost data, structural and finish level information
A16A11	This is a very broad question, because like architecture every school is different. The key is creating the optimal learning environment that will enhance the students' ability to learn. The elements for this will vary based on age, discipline, material being taught. For instance natural lighting will enhance a learning environment, however will not be beneficial if you are designing a room for computer training. These best elements for the particular field of studied are usually determined in the programming phase.
A16A13	Student population solutions spatial solutions, program requirement solutions, Special needs solutions, guidance as to MEP solutions, Guidance in pursuing LEED certification, guidance on the socio-economic impact, cost and time line.
A16A14	TEA standards, rules and regulations for governmental entities, current (or future) construction costs, recent trends in school design solutions, ways to save money and time, facility design ideas that have demonstrated impact on educational outcomes
A16A14	Healthy environment: indoor air quality, natural lighting, acoustic enhancement. Optimal space: classroom size to allow individualization, group activities, creative noise and movement, Enrichment programs: space for electives and supplemental programs to support and enhance core curriculum Fitness: Food service quality and size and Exercise space for all students.
A16A15	A variety of teaching and learning spaces. A building that supports the concepts of teaching to the brain. Opportunities for multiple learning skills and types to flourish.

A16A16	Program Information on new trends in better learning environments Information on new trends in green architecture Cost trends Key challenges
A16A17	We are a very large firm (350+ people) and design more than $1 billion in educational facilities/year through 5 offices across the country. We try very hard to share the information gathered and experience gained through all those projects with superintendents in the process of designing school facilities. We see ourselves as a resource to help superintendents plan for the future. Ultimately, the superintendents make the decisions, but we are there to help them consider/explore options.
A16A17	We must teach individual students (regardless of age), strive for successful outcomes for each student. We must prepare kids for the future using teaching methods appropriate to them. That means that technology must be a tool, an integral part of instruction. Every teacher and every student must have their own digital device---BUT teachers must learn to use them effectively for instruction---they need to catch up with the kids they are teaching. We must focus on higher order thinking skills, problem solving and communication skills in addition to content/knowledge skills. We must have school high flexible so that they can constantly change in response to the changes happening in the world around them. Egg-crate schools will not work in the future. We must connect schools to the real world so that students can see the relevance of their work and teachers can stay abreast of the world for which they are preparing students. We need to make time flexible for that it can serve individual learning styles. Students learn in different ways at different paces. The school days should not be divided into fixed periods for secondary students. There should be some flexible time every day for both kids and teachers. Schooling should be a continuous service, not a timed, seasonal event. Kids should be able to learn anytime, anywhere---not just sitting in rows in a teacher's room. Students should have a place to work in schools. They should not move from teachers' space to teachers' space all day with only their back packs. They should have some place to call their own and real opportunities to use them. Kids of every age need close meaningful regular substantial support form one or more adults. Shuffling kids from class to class does not accomplish this at all.
A16A18	We are very focused on trying to help school districts understand the importance of their entire facility infrastructure PRIOR to moving forward with design. We work very hard to impart the importance of full feeder system facility assessment and master planning. We like to model a variety of scenarios for districts facilities. Often, by building a new campus, a small district's entire "grade stacking" model may be impacted. Frequently, older campuses designed for one age group gets recycled for a different age group. Sometimes this works very well, sometimes it is less successful. It is usually best to go through a rigorous analysis that puts a number of options on the table for objective analysis..........prior to moving forward with a bond issue. This process validates a district's need, if the public is involved, it helps build confidence that the District's real and most pressing needs are being met. And it usually results in a single master-plan option or "road-map" being adopted for future facility improvements. It can also be overlaid with demographic projections so that a district can understand the "capacity triggers" which they should begin to track as they gain student enrollment. After a rigorous master-planning process, we like to do a rigorous facility programming effort, including identifying every space, its size, and virtually every piece of furniture or equipment which is necessary in the facility. Sizes are confirmed with room layouts (not designs) which confirm that everything in the program can be accommodated in the allotted square footage. This documents everything that we need to design and simultaneously gives us the basis to extract needed data from the building users BEFORE we begin design.

A16A19	In basic terms, we need to provide design solutions that match their parameters. The challenge is to manage expectations & communicate in terms (& methods) that are understandable to the layperson.
A16A20	Any applicable current trends in design or construction. The recommended construction methods and materials commensurate with the budget. Site limitations and implied design parameters.
A16A20	Daylighting in all academic areas. Flexible interior spaces to allow changes in use.
A16A21	accessibility, good acoustics in learning environment, enhanced audio in the classroom. access to computers in every classroom for students. Teacher computer connected to digital projector. Natural lighting. Multifunctional / flexible teaching spaces. Smaller public spaces that encourage social gathering.
A16A22	tea standards capacity studies of existing district facilities educational design trends code review cost estimate a design/program a project schedule
A16A22	technology flexibility large group instruction spaces activity areas science labs learning media center classrooms (the correct # and size) computer labs
A16A23	tea standards capacity studies of existing district facilities educational design trends code review cost estimate a design/program a project schedule
A16A24	technology flexibility large group instruction spaces activity areas science labs learning media computer labs center classrooms (the correct # and size)
A16A26	state of the art status check related to school design (current trends, forward looking); current description of the design construction industry, current cost trends
A16A26	traditional and non traditional learning environments; integration of community programs, high level of safety (passive and active) systems
A16A27	budgets, latest research
A16A28	educational specs design stds master specs
A16A29	flex spaces, wireless communities
A16A3	Opportunities for collaborative learning outside the traditional classroom setting. Opportunities for outdoor learning. Daylight.
A16A30	# of student population, classroom periods per day, pedagogy, teaching methodology, vision for the function and aesthetics of the building
A16A30	multifunctional spaces that support individual learning, small group and large group learning environments
A16A32	current cost trends, current educational platforms, types of construction
A16A34	flexible spaces for student discovery and teaming, individual quiet spaces and areas that stimulate the mind
A16A35	information and examples (tours) of other projects whose components represent the best practices in educational design
A16A35	infrastructure that can be expanded able (HVAC, power, technology, etc) Flexible spaces, excellent lighting and acoustics
A16A4	Spatial Concepts that support better Learning Environments Cost per SF Review Budget Allocation Scenarios Optional Schemes & Concepts Renderings Schedule Proposal
A16A4	Flexibility for Different Group Sizes, Activities, Schedules Opportunities for Interaction Options & Choices Stimulating, Non-Generic Spaces Sense of Belonging, Caring Proper Lighting & Acoustics, Daylighting Sense of Transparency Connection to Community

A16A5	How instructional methods incorporated into the design, security elements incorporated into the design, square footage, information on who has been involved input with regards to HOT buttons, cost, success in meeting district standards.
A16A5	Variety of sizes of spaces that support a variety of learning abilities, providing proper lighting, acoustical and air quality, technology, natural lighting.
A16A7	It depends on the services that they ask us to provide: facility recommendations, planning analysis, bond planning and coordination, building design, CA / CM. Each job would require a different scope of services from architects.
A16A7	Spaces that are interesting, safe, durable, flexible, and challenging. The spaces need to be something that inspires and supports the learning process.
A16A8	Knowledge of best practices, Benchmarking of current work, better stated "Ask the right questions"
A16A8	differentiated learning environments, relevant experiences, engaged and inspiring activities, focused on students needs.
A2-5A36	-latest technology -LEED information -planning techniques to achieve what they want
A2-5A37	philosophy of firm, info on direction of where school education is headed, data that supports good school design
A2-5A37	interesting views, student involvement, use of diff materials, exposure of students to function of school
A6-10A39	We continually check and re-check information given to us via the school district's standards. We let the school's representatives know when we believe there are other better performing, optimal solutions to their challenges.
A6-10A41	Construction Cost Data, New Learning Modules, Updated Codes, School examples
A6-10A41	Technology, Smaller learning areas,
A6-10A42	Daylighting Informal spaces for group work one computer for each student - laptop work areas for teachers with desk / computer separate from classroom so that students can more often stay put and TEACHERS move from class to class after hours access to resources in library between close of school day and 6 pm safe after school program with learning centered activities including homework assistance and work area for self directed homework activities

TABLE C-6. Superintendents' and Architects' Responses to Curriculum Programming

Participant Code	Response
S11-15S1	The superintendent should share the district's philosophy about the "feel" that the building should present; the level of quality for long-term maintenance; the level of funding for aesthetic appeal both interior and exterior, the specifics of the function of the facility -- how it will be used; the specifics of the numbers of students / staff; ages and abilities of students; schedule; educational expectations / specs; and the level of involvement expected by other staff members.
S11-15S2	the appropriate type classrooms, technology, an aesthetically pleasing environment
S11-15S2	Program and curriculum description, student population, district facility specs
S11-15S3	Budget, educational programs and facilities standards
S1S69	There is a myriad of ideas that come to mind, but obviously enrollment, personnel, special curricular needs, state requirements; safety concerns; student control issues; financial constraints; and community use, to name a few.
S1S72	Data--enrollment and projected enrollment Program information--what programs do we have now and what programs do we plan for the future
S1S74	Curriculum, building usage, community expectations, staff expectations, resources.
S1S78	Science labs, computer access and computer labs, libraries or media centers and plans that are conducive to ensuring students feel safe.
S1S83	A clear picture of what is envisioned such as photos from other schools, the community's expectations, and the educational philosophy behind the design.
S1S83	Every facet of the building must support student learning.
S1S88	Purpose of facility number of students and teachers to be served Specific activities that will take place in the facility Cost limits
S1S89	Anticipated size or enrollment, courses to be taught, anticipated growth (if any), budget available.
S1S91	education specifications developed in conjunction with the faculty and administrators
S1S94	All the available resources a district can afford to provide for the programming needs of the facility. Flexibility to adapt to new technologies, accessibility for the public, easily maintained to high standards, safety and security.
S2-5S12	Everything we can afford so long as it matches the learning-teaching that goes on in the building.
S2-5S13	A program of requirements that details number of classrooms, unique attributes of specific areas, numbers of kids served, special programs, special local requirements such as district selected roofs, hardware, etc., community sense of structural attributes, i.e., will this school fit the community perception of schools, --- there are really too many items to detail here.
S2-5S17	Enrollment projections and planned programs for the school are musts. New schools must be able to provide the needed spaces for the instructional programs that will be provided at the campus. The school must not have portable buildings so after it is opened.

S2-5S18	All of the facility should, in some way, directly or indirectly support student learning. In addition to the needed square footage per student, technology needs, lab requirement needs, etc. down to the width of the hallways plays a supporting role. Example: If the hallways are too narrow, then conflicts increase and the attention of the students is drawn from their classroom activities to hallway activities. Color schemes also play a role in supporting learning.
S2-5S19	Everything should be focused on student learning. The lay out of the campus, the design of the rooms, the types of lighting to be used.
S2-5S20	Programming, budget, site features
S2-5S22	Programming--they are able to tell you what other schools are doing and what the costs will be for certain programs. They can also help with innovative design.
S2-5S23	Capacity in # of students. Grade levels Programs within school Past construction history of present buildings Plan for future construction
S2-5S26	Levels taught, special needs or programs on the campus. Number of students and classrooms needed. Expected growth or declines. Science taught (labs needed), extracurricular areas, access needs or concerns, safety needs or concerns.
S2-5S30	Student population, curriculum, future needs
S2-5S32	number of students to serve, programs to be included, quality of materials to use for construction
S2-5S35	Design that focuses on instruction
S2-5S36	Everything should be designed to achieve a quality learning and teaching environment
S2-5S38	I will the design of the building help meet the needs of you student population.
S2-5S39	Educational need, space desires, special needs to your district, community standards, past history.
S2-5S43	Suggested materials Overall concept Educational Specifications Cost Limitations
S2-5S46	Age of student type of instructional strategies utilized Technology utilized goals of district
S2-5S46	Cost per sq ft for various items wanted in project to determine whether affordable. I believe the plant should be planned around the instructional environment.
S2-5S49	potential locations - number of students to serve - curriculum or course requirements - utility issues - past history of construction issues -
S2-5S50	Previous building and utility plans, building/classroom usage plans, budgetary expectations, input from campus and district improvement committees, desired materials, technology needs,
S2-5S51	Function, instructional needs, funds available, longevity, future uses of the facility, etc.
S2-5S53	Technology, large classrooms, adequate labs and support areas, library, cafeteria, gym, everything about a school should support student learning.
S2-5S59	Programming, technology, needs for various rooms, water, network, etc. input on areas for bus and parent pickup, preferred materials for hallway covering, flooring, preferences for mechanical systems
S2-5S64	All programming information. How instruction is provided to students at the school. How the school will be administered. Technology expectations. Classroom instructional methods/strategies. Security expectations. Energy use expectations. Local boards must provide any specific expectations to the architect prior to planning (conventional cooling systems vs. geothermal systems, local providers).
S6-10S7	Grade configurations, program information, educational philosophy, work group requirements, budget, lot configuration.

S6-10S9	Need to provide a vision of what education will look like in the future, not today. Capacity of the school, programs that will be included in the school
A11-15A44	1. sufficient space for the number of students 2. facilities that respond to some kind of educational vision or concept that the district has.
A11-15A44	Budgetary parameters, schedule needs, educational goals, names of which district staff will have input or responsibility for which various issues, decision making process (i.e., what issues need school board input vs. staff input). General input about priorities, also what are "hot button issues" that may require special attention.
A11-15A45	the district's vision and latest educational trends impacting the facilities
A16A10	School district needs to provide enrollment projections, curriculum requirements, instructional principals, site data, etc.
A16A13	Educational goals, Educational philosophy, Mission statement, demographics inclusive of socio-economic data, special programs, participants in the design process, budget, time line, commitment to LEED certification.
A16A14	Healthy environment: indoor air quality, natural lighting, acoustic enhancement. Optimal space: classroom size to allow individualization, group activities, creative noise and movement, Enrichment programs: space for electives and supplemental programs to support and enhance core curriculum Fitness: Food service quality and size and Exercise space for all students.
A16A14	TEA standards, rules and regulations for governmental entities, current (or future) construction costs, recent trends in school design solutions, ways to save money and time, facility design ideas that have demonstrated impact on educational outcomes
A16A15	A variety of teaching and learning spaces. A building that supports the concepts of teaching to the brain. Opportunities for multiple learning skills and types to flourish. Education Master Plan, Strategic Plan and Education Specifications. Any knowledge defined as Program Definition will be helpful in creating the elements and environments desired.
A16A16	Long-term district goals Educational philosophy and approach Curriculum Financial challenges Operations and maintenance approach Special needs/desires of the community Program Site
A16A17	We must teach individual students (regardless of age), strive for successful outcomes for each student. We must prepare kids for the future using teaching methods appropriate to them. That means that technology must be a tool, an integral part of instruction. Every teacher and every student must have their own digital device---BUT teachers must learn to use them effectively for instruction---they need to catch up with the kids they are teaching. We must focus on higher order thinking skills, problem solving and communication skills in addition to content/knowledge skills. We must have school high flexible so that they can constantly change in response to the changes happening in the world around them. Egg-crate schools will not work in the future. We must connect schools to the real world so that students can see the relevance of their work and teachers can stay abreast of the world for which they are preparing students. We need to make time flexible for that it can serve individual learning styles. Students learn in different ways at different paces. The school days should not be divided into fixed periods for secondary students. There should be some flexible time every day for both kids and teachers. Schooling should be a continuous service, not a timed, seasonal event. Kids should be able to learn anytime, anywhere---not just sitting in rows in a teacher's room. Students should have a place to work in schools. They should not move from teachers' space to teachers' space all day with only their back packs. They should have some place to call their own and real opportunities to use them. Kids of every age need close meaningful regular substantial support form one or more adults. Shuffling kids from class to class does not accomplish this at all.

A16A17	We need real in depth concepts for how the district wants learning to work---and how they want to teach to realize that learning. Everything after that including a detailed program of requirements for design purposes, budget and schedule we can help the district define---BUT they must be clear about teaching and learning first--that is the base from which everything else springs.
A16A18	Most of our school district clients are small "single high school feeder" districts of 4a or smaller. The best leadership comes from superintendents who are collaborative leaders. The best input comes from those who clearly layout boundaries to their staff and let them be involved in the design process. The most important role a superintendent can play is that of the conduit to the public. Intelligent selection of community leaders in prebond planning, picking good internal and e1ternal leadership is critical to a bond program's success. No one else is positioned to play this role. Superintendents are often less effective in "micro-managing" the details of the actual design than in "articulating the vision" laying out the strategy for the public relations. Without a successful election, there will be no new schools.
A16A20	School budget, school population, school location/site, educational program, any particular problems that need addressing.
A16A22	educational concepts grade alignment information enrollment information surveys
A16A22	tea standards capacity studies of existing district facilities educational design trends code review cost estimate a design/program a project schedule
A16A23	educational concepts grade alignment information enrollment information surveys
A16A24	general direction on school and support from curriculum as much involvement as desired
A16A27	program standards of school district
A16A28	design stds, programming sessions, educational goals
A16A29	ed specs
A16A3	Budget Schedule Student Capacity Program Any initiative to incorporate design elements that support unique learning opportunities?
A16A30	# of student population, classroom periods per day, pedagogy, teaching methodology, vision for the function and aesthetics of the building
A16A30	# of student population, classroom periods per day, pedagogy, teaching methodology, vision for the function and aesthetics of the building
A16A31	daylighting flexible configuration technology career education lessons learned from prior schools and departments current instructional curriculum direction
A16A32	how education will be delivered, size of schools, organization of schools (department, small community), budgets
A16A32	interdepartmental collaboration, smaller communities for more 1 on 1 instruction, energy efficient design, place of being for all students
A16A33	program or educational specifications
A16A5	Grade level information, capacity, instructional method desired by the District at the campus, District Technology requirements, Program of Spaces if available, site information.
A16A5	How instructional methods incorporated into the design, security elements incorporated into the design, square footage, information on who has been involved input with regards to HOT buttons, cost, success in meeting district standards.
A16A8	Instructional philosophy, capacity, grade alignments, curricular requirements, demographic, special needs population, federal program qualifications etc.

A16A9	You must start with a vision for teaching and learning---then define the scope, schedule and budgets for projects to support that vision.
A16A9	We need to understand the district's aspirations for teaching and learning. We need info on demographics and info on existing building configurations and conditions---facility assessment date. AND we need to know about district finances and bonding capacity. We also need to know about their technology systems and how their support teaching and learning.
A16A9	A concept for student learning is the most important first step. 99% of the time, educators start with assumptions about how student learning works and focus on minor nuts and bolts. They should push hardest on big ideas about teaching and learning---then get to the details. We should not start with the assumption that schools will have classrooms, instruction regulated by bells, instruction one subject at a time, stand and deliver, etc.
A2-5A36	-What teaching methods are used (pod, cluster, etc) -Special Needs or programs of the district -Master Plan -Things that work and things that don't in the e1isting schools -program
A2-5A38	cost, ed programs, floor plans for example
A6-10A42	Long term goals for the district in terms of curriculum /programs Key priorities established by the school board that shape investment in resources / equipment and specialized programs that need facility support Leadership in identifying key decision makers early in the process for the architectural team to work with in establishing aesthetic direction and program response to educational objectives
A6-10A42	Recommended program in response to stated educational objectives Cost estimates / forecasts

TABLE C-7. Superintendents' and Architects' Responses to School Climate

Participant Code	Response
S11-15S1	high visibility; technology for learning/admin/safety; aesthetically pleasing and low-maintenance finishes; comfortable traffic flow; common spaces (library/cafeteria/gym/foyers/courtyards/etc) that are large enough and 'draw' students; display areas for art and student celebration.
S11-15S3	adequate space in all learning environments, lighting considerations and Indoor Air Quality provisions
S1S69	Student friendly environments; ease of maintenance
S1S73	Appropriate space, storage to avoid clutter, light, good traffic design.
S1S77	Ample classroom space, adequate lighting, an environment conducive for learning (colors, windows, wide hallways), security provisions, technology implementation.
S1S82	Comfortable setting, tech support, ease of student movement
S1S84	Appropriate science rooms, appropriate academic rooms, a functional library and teaching theater, appropriate design for hallways and cafeteria to cut down on travel areas, community health center, design for learning areas outside.
S1S88	Safety and security Good traffic flow Access to current technology Bright, attractive, professional atmosphere
S1S89	technology, light, safety
S1S90	1. Technology 2. Friendly, welcoming atmosphere
S1S91	technology learning spaces that have natural light
S1S93	There should be a real emphasis on creating an environment that is light, inviting and secure. I'm sure there will be a lot of answers that try and incorporate current curriculum into the design, but I believe curriculum to be so fluid that this is an exercise in futility. Having a structure built to last for generations that is both extremely flexible and efficient, with an emphasis on usability for the long-haul, would meet the needs of many, many children.
S2-5S11	Air quality, ventilation, windows, plenty of labs, computer accessible in each area of the building
S2-5S14	Library/electronic access for all classrooms students/large group meeting/security issues/Gyms etc.
S2-5S16	Natural lighting, the ability to change the classroom to meet new styles of teaching. (Lots of flexibility)
S2-5S19	Everything should be focused on student learning. The lay out of the campus, the design of the rooms, the types of lighting to be used.
S2-5S20	Technology, spacious classrooms, quality science labs, effective library,
S2-5S21	traditional layout wireless internet access for anywhere anytime learning
S2-5S22	libraries, gym, open areas for large group instruction, natural light, adequate sized classrooms, spaces that are easily cleaned
S2-5S23	Computer labs Adequate space Academics separated from extracurricular
S2-5S24	adequate space technology lighting safety
S2-5S26	The educational portion of school design that addresses the school safety, climate, learning/instruction processes, and community needs.

S2-5S33	the ability to monitor and administer student learning as efficiently as possible. technology needs should be considered, but long term debt for short term needs is not a good idea for poor districts in my opinion. paying for items that will be outdated and outsourced after 5 years over 30 does not make a lot of sense. The design should make the students want to learn, be aesthetically pleasing while serving its purpose.
S2-5S38	The colors of the class rooms, natural light entering the classroom and enough space.
S2-5S43	Flexibility Adequate power, lighting, technology Adequate space Durable materials
S2-5S49	classrooms - restrooms - offices - technology - security cameras - good lighting - pleasant colors - communication systems
S2-5S50	Comfortable and safe surrounds, adequate electrical and technology support (including classroom computer centers), areas for teacher and student collaboration, area for parent and teacher meetings, etc.
S2-5S54	technology infrastructure, security systems, capacity for growth, attention to lighting, fixtures and hardware. design should be specific for a school and not just and office building e.g. hygiene and cleaning issues. environmental issues
S2-5S56	Storage, infrastructure for technology. Updated phone, paging, alarms. Room size to support desks and computer stations. Labs for science. Conference room to be used for ARD's, department meetings, administrative meetings, etc. Build for growth. Adaptable. Hallways that can be monitored from administration offices. Access to public through one door. Landscaping that does not affect foundation or limit view to the building. Use of sunlight in halls. Outdoor lighting that shines on the building, that keeps the crickets and other bugs away from building at night. Conservation of water, electricity through timers, programmable thermostats, motion detectors, auto flush, etc. Ease of maintenance in high traffic areas like bathrooms and classroom/hall floors. Parking. Access to building on sidewalks to limit mud and grime. Thought to lockers or no. Plenty of room for circulation of students. Thought on layout of classrooms to facilitate class change. Central office at main entrance, with view of halls. Bathroom facilities for staff. Air dryers for hands. Systems that are easy to train to use and maintain and find parts for.
S2-5S60	facilities that are secure, healthy, safe, and arranged in order to provide these things and the best instructional setting for the mission
S2-5S62	safety, security, lighting, state of the art technology,
S6-10S10	Technology, classroom structure identifying the layout of the classroom and spatial considerations, lighting, floor design, color schemes, ventilation systems that allow a high flow of oxygen into the classrooms, noise levels, (chalk boards, white boards, smart boards or other), phones in the classrooms yes or no, security issues, etc.
S6-10S7	Flexible spaces, technology, collaborative areas, all spaces, including outdoors, can be used for learning, green concepts.
A16A3	Opportunities for collaborative learning outside the traditional classroom setting. Opportunities for outdoor learning. Daylight.
A11-15A45	technology, natural lighting
A16A11	This is a very broad question, because like architecture every school is different. The key is creating the optimal learning environment that will enhance the students' ability to learn. The elements for this will vary based on age, discipline, material being taught. For instance natural lighting will enhance a learning environment, however will not be beneficial if you are designing a room for computer training. These best elements for the particular field of studied are usually determined in the programming phase.

A16A12	Safe, clean, secure, well designed environment in the classroom and support facilities that implements technology effectively. Lighting levels, noise control, and appropriate colors have significant impact.
A16A13	Social/Cultural receptive environments, proper lighting preferably natural, more than adequate HVAC, flexible space, secure environments, technology flexible environment, ease of adaptability and visually stimulating.
A16A14	Healthy environment: indoor air quality, natural lighting, acoustic enhancement. Optimal space: classroom size to allow individualization, group activities, creative noise and movement, Enrichment programs: space for electives and supplemental programs to support and enhance core curriculum Fitness: Food service quality and size and Exercise space for all students.
A16A16	daylighting flexible learning spaces technology support buildings that teach durable materials green materials
A16A20	Daylighting in all academic areas. Flexible interior spaces to allow changes in use.
A16A21	accessibility, good acoustics in learning environment, enhanced audio in the classroom. access to computers in every classroom for students. Teacher computer connected to digital projector. Natural lighting. Multifunctional / flexible teaching spaces. Smaller public spaces that encourage social gathering.
A16A24	favorable climate control, acoustics, change design spaces for flexible teaching, pleasant environment, safe environment
A16A25	safe environment, technology, daylight in classrooms
A16A27	natural light, acoustics (good), reflective surfaces, latest technology, indoor air quality
A16A28	technology healthy environments meeting places
A16A31	daylighting flexible configuration technology career education lessons learned from prior schools and departments current instructional curriculum direction
A16A35	infrastructure that can be expanded able (HVAC, power, technology, etc) Flexible spaces, excellent lighting and acoustics
A16A4	Flexibility for Different Group Sizes, Activities, Schedules Opportunities for Interaction Options & Choices Stimulating, Non-Generic Spaces Sense of Belonging, Caring Proper Lighting & Acoustics, Daylighting Sense of Transparency Connection to Community
A16A5	Variety of sizes of spaces that support a variety of learning abilities, providing proper lighting, acoustical and air quality, technology, natural lighting.
A6-10A42	Daylighting Informal spaces for group work one computer for each student - laptop work areas for teachers with desk / computer separate from classroom so that students can more often stay put and TEACHERS move from class to class after hours access to resources in library between close of school day and 6 pm safe after school program with learning centered activities including homework assistance and work area for self directed homework activities

TABLE C-8. Superintendents' and Architects' Responses to School Safety

Participant Code	Response
S11-15S1	capacity to lock down easily; cameras and systems for monitoring activity inside and outside building; single entrance through checkpoint without access to student spaces; high visibility along corridors and stairwells.
S11-15S2	secured entrances, cameras, design for appropriate supervision
S11-15S3	web cameras, entrance monitored by school staff, traffic considerations for both ingress and egress
S16S65	Design specs. that meet the demands of your local community. For the most part in today's environment controlled access is a key consideration along with security cameras.
S1S66	Exit and entry doors and visibility.
S1S67	limited access. secure entry. classroom doors that lock from the inside.
S1S68	safety learning centers
S1S69	Visibility avenues for ease of security personnel.
S1S70	Fire alarms, sprinkler systems, security cameras, alarm systems. night safety lighting, Regulations for special needs children.
S1S71	That would vary depending on the size of the district and the location of the district (also the size and location of the school).
S1S72	Secure entries that require visitor to enter through the office. Keyless entry. Surveillance equipment with digital recording. State of the art communications systems.
S1S73	Lock down capabilities, must go through secretary to enter building, cameras, visibility to all areas.
S1S74	Design for safety, surveillance, access
S1S75	Few entrances and exits. A climate that is not "jail like" but still offers maximum protection.
S1S76	Review the safety measures needed and review plan accordingly to make sure they match. --have seen lot of short cuts that later proved to be just cost saving measures.
S1S77	Surveillance equip., doors that are fire proof & easy to secure, communication devices, police presence, alarms, and sufficient outside lighting.
S1S78	Surveillance cameras; no areas where students can hide out nor areas where others can hide; campuses that can be locked down or evacuated easily; cafeterias, hallways and areas that can all be monitored easily.
S1S79	Security features that is best for your needs.
S1S80	non-keyed doors inside and out - needs a number pad or swipe card capabilities security cameras limited, well placed doors to the outside a design that leaves no room for "obscure" areas where student activity could go undetected (back hallways, basements, etc)
S1S81	This is taken care of with codes etc.
S1S82	cameras, lighting,
S1S83	Our design was developed around safety first. We have developed our entrances with this in mind.
S1S84	All the mandatory safety equipment, AED location requirements met, cameras in large meeting areas and parking lot, safety design for school offices.

S1S85	Access controls, monitoring equipment, Strategic location of monitoring equipment, lighting equipment with proper location.
S1S86	Surveillance cameras and alarm systems
S1S87	No nooks or crannies. Cameras. Study the research.
S1S88	Open public areas, no hiding places good lighting security cameras limit outside access to one or two locations
S1S89	safety and access concerns
S1S90	Technology supported monitoring of student movement and limited entrance from outside.
S1S91	cameras locked doors design with view
S1S92	Video security equipment throughout the school, alternate communication system that can replace damaged or busy phone lines, a crisis response plan that has been practiced by school personnel and students.
S1S93	Entries and egresses that allow people out and not in. Landscaping and ground layouts that take into account those that might do harm to our children. Air quality has become more and more of a concern as facilities have become more and more airtight, must also be addressed. Lighting that utilizes a variety of natural sources not only provides efficiency and safety, but also reduces fatigue should be considered and used wherever possible.
S1S94	Controlled access points, centralized administration area to admit visitors, security cameras, no lockers and limited hiding places for contraband, state-of-the-art inter-room communication system, mass communication system for parental and public notification.
S2-5S11	Locks inside and out, main entrance, visibility, camera system
S2-5S12	Technology; fencing; cameras; the building should be a unit without needing to go outside; clearly visible lines in corridors, etc.
S2-5S13	Controlled and monitored access, no blind corners or nooks and crannies.
S2-5S14	electronic locking systems/high visibility of students (no "blind spots)/ cameras/weather monitoring/perhaps tornado "room"/fire alarms including for visually &and hearing impaired/visitor ID system/smoke alarms, etc.
S2-5S15	bus zones, reinforced areas for storm shelter, meet all fire codes and have accessible exits
S2-5S16	Clear designated exits, camera systems, etc.
S2-5S17	The school should be designed in a manner that helps the campus secure areas of entry and exit. The school should not be designed with hiding places for students.
S2-5S18	There are many aspects of the design that support student/staff safety. 1. Make sure blind corners are minimized. 2. Doors that swing in the proper direction. 3. Doors that lock from the inside. 4. Proper/required alarms for fire, etc. 5. Security cameras in certain areas - inside and outside. 6. Call-back functions from classrooms to office. 7. Design of facilities for staff observations of students. 8. Requirements such as fire-extinguishers, etc. 9. Surrounding neighborhood considerations may drive playground security needs (fencing, etc.) 10. Traffic flow considerations in parking lots and drive-through. 11. Type of construction materials - certain materials are more fire-resistant than others.
S2-5S19	Minimum points of entrance. The ability to close down areas of the school without interference in other areas. The less spread out a campus is the better.
S2-5S20	restricted access at entrances, surveillance cameras, wide hallways,
S2-5S21	cameras perimeter fencing layout directs all entering to one access point
S2-5S22	secure entry areas, security cameras
S2-5S23	Entrances that flow thru the front office
S2-5S24	inaccessible to persons off the street there should be no areas that allow students to hide from staff supervision

S2-5S25	clear line of sight for front door, security cameras and viewing room, doors that lock from inside as well as outside, plenty of exits
S2-5S26	Current design modes to address student protection as well as future needs for weather, community, and emergency actions that can be preprogrammed into the design.
S2-5S27	limited outside access parking lot layout playground layout
S2-5S28	controllable access & regress, no blind spots
S2-5S29	Cameras Buzz in doors Lighting Traffic control Communication
S2-5S30	technology (cameras), limited external access to building
S2-5S31	Current security systems and Self contained non accessible areas
S2-5S32	design to prevent outside access from multiple points
S2-5S33	cameras where ever and when ever possible, with hard drive backups.
S2-5S34	door locks that are conducive to lock downs and controlled entry ways
S2-5S35	All the up to date ideas
S2-5S36	Access
S2-5S37	Cameras, alarms, visibility from many directions, lots of lighting (natural and man-made).
S2-5S38	Cameras (Monitors)
S2-5S39	Extremely limited access
S2-5S40	Current building codes, controlled access form outside, electronic monitoring
S2-5S41	One point for public access that can be viewed by staff, provisions for adequate surveillance cameras, fencing, etc....
S2-5S42	The ability to lock down individual rooms, a single check-in entry with the ability to monitor both visually and technologically. The state already has several codes to meet fire and health needs.
S2-5S43	Controlled access Infrastructure for cameras, access control etc. Limited passageways No hidden corridors or spaces
S2-5S44	Minimal entrances and exits, video surveillance, limited access from exterior roads, woods, etc. Secure lobby area that limits access to the rest of the building
S2-5S45	single entry point during the day, shielded play areas, ability to section the building for after school use
S2-5S46	Security Cameras Alarm system Well lit entrances and exits appropriate entry hardware Discussions with staff prior to design to determine needs of the specific campus in relation to its location.
S2-5S47	reduced number of entrances/exits security cameras admin offices located close to main entrance doors that can be quickly secured
S2-5S48	Safety plan, cameras, doors, visibility, placement of offices,
S2-5S49	cameras - fire alarms - pa systems
S2-5S50	Video cameras and support wiring (inside and out), classroom doors that lock and unlock from the inside, adequate lighting outside of building, PA system throughout building, etc.
S2-5S51	See previous answer.
S2-5S52	Manageable campus that is easy to monitor and allows for flow of students throughout the building.
S2-5S53	Clearly marked and accessible exits that only open from the inside, monitored access points, fire alarms, bell/P.A. system, phones in classrooms. Video surveillance is available.
S2-5S54	entrances and exits to parking how many outside doors what type of windows fire control systems classroom intercom system security system

S2-5S55	For school safety, single access entry should be a priority. Perhaps magnetic door locks should also be included.
S2-5S56	Communication system with backup power in emergency, one that allows paging and a panic button in a classroom for one way communication. One that also runs the emergency lighting, alarms, bells. It is easy to program for several schedules. Remotely accessible. A digital monitoring system of the parking lot, halls and lunchroom at least. One that will auto save for 14 days. Outdoor lighting shining on building, again to keep bugs and such away. Lighting that will last awhile. The ones I have experience with the ballast burns out each year. Windows that can be popped in an emergency exit from classrooms, like on buses. Master key system. Safe, ventilated storage of cleaning chemicals.
S2-5S57	New technology Cameras Fencing Roadway improvements
S2-5S58	Safety has become a major concern in resent years and schools should be capable of monitoring entrance into every building and room as well as being capable of providing immediate lock down of exterior doors. In addition, schools should highly consider safety from natural disasters in the construction of buildings. If "tornados" are a high possibility in an area, monolithic dome construction should be given consideration.
S2-5S59	secure entrances, controlled day entrance, classroom / campus communication, community areas used at night secured from educational areas
S2-5S60	secure entrances and exits adequate communication links knowledgeable staff members appropriate policies and procedures
S2-5S61	Automatic door locks, pick up and delivery areas, principal office few of entry, camera system.
S2-5S62	Accessibility or lack of by outsiders, lighting, alarm systems, monitoring systems
S2-5S63	Security cameras (digital CCTV and Pan/Tilt /Zoom PTZ, fencing, Exterior lighting, proximity card access for all doors. Emergency safety plan, Lock Down Plan.
S2-5S64	Technology. Design of student/staff movement through the building during the day and after hours. Use of building during non-school time. Effective communication systems throughout the building. Parking lots designed for traffic and pedestrian movement.
S6-10S10	video cameras, intercom systems, doors that lock from the inside and outside, doors that windows must have some type of bullet proof material within the glass, areas in the classroom that will sustain bad weather shelters, metal detectors, bathrooms that are easily accessed by school personnel in case of an emergency, limited entrances to the school but they must also meet fire code, etc.
S6-10S4	communication tools escape routes
S6-10S5	Cameras, access control, one main entrance, fire alarms, fencing, security personnel.
S6-10S6	security cameras telephone system in classrooms alarm system automatic locking doors card swipe
S6-10S7	Web-based camera systems, including PTZ; secured entry requiring access through office; door sensors tied to IP telephony. In the future RF identification systems could be helpful; redundant fire and phone systems; wireless overlay accessible by emergency responders.
S6-10S8	Bring in a school safety specialist.
S6-10S9	See question #5.
A16A1	CONTROL OF ENTRIES , HIGH VISIBILTY , CAMERA SYSTEMS , I.D.'S OF EVERYONE , I.D.'OF VISITORS , SITE ACCESS RESRICTIONS , NO LOCKERS , ETC.
A16A3	Planning that supports visual and physical control of access points to the site and the building.

A16A4	Cameras, Surveillance Digital Security Access Control Safety Vestibules Fencing where appropriate
A16A5	Security vestibules, cameras, communication systems between office and classrooms, id check point at entrance, good visibility of entrances both from exterior and interior.
A16A7	Generally, defensible space. The requirements could range from a full time guard to cameras and metal detectors, but designing the facility to be safe in the first place is the most important step.
A16A8	clear entry, clear way finding, secure entry, managed visitor access, valued by students, adequate space that supports behavior (i.e. generous circulation paths), vistas for adult observation of expanses of facility
A16A9	Strong relationships between kids and adults. Threats to school safety are much more an internal than external problem---and that stems from having schools full of kids that no one really knows or cares about.
A16A11	The number one element is secured entry. This is typically done with card access at all doors and a security vestibule at the front of the school. The security vestibule requires visitors to the school to enter through the main administration area to check in before gaining access to the school. Other elements can include security cameras, metal detectors and security personnel. My personal opinion is that these make the facility for more like a prison than a learning institution, reaction being that the students will act accordingly when treated in this manner.
A16A12	Open, well lit areas with a minimum of hiding places. Key placement of administrative and support offices to effectively control access to the campus and building.
A16A13	Technology that supports early/rapid warning (camera, alarms, etc.), devises to secure individual classrooms, additional egress from classrooms other than through windows, security glazing in C/R, Assembly and Admin. areas.
A16A14	Features: keyless entry system, passive security vestibule at main entry, surveillance cameras in public spaces, security alarm system, lighting on light/motion sensor, Clear sight lines along corridors, minimum nooks and crannies inside and outside of building for hiding or mischief.
A16A15	An awareness of the client (student). The buildings need to respond to the developmental needs of the students.
A16A16	security vestibule video surveillance locked exits good sight lines proper orientation on the site
A16A17	Close student/teacher relationships and great teaching are by far the best security system. Sadly, the most dangerous people in schools have turned out to be folks who were supposed to be there in the first place---kids. BUT, they were kids that that teachers did not know well enough to see that they needed help. We can provide security vestibules, fences, access control systems, cameras, etc.---but they won't count if the real problem comes from the very people we want in the schools.

A16A18	It starts with site planning. Traffic safety. Schools should be designed like airports. ALL traffic should be counterclockwise so passengers are dropped off curbside. Separate staff parking and drives from the public. Lots of auto cueing at schools below high school. Keep schools smaller where possible (less than 1000 students below high school, preferably 600 to 800). Bus drop-offs directly to covered area off Cafeteria. Separate service areas. Single point of public entry with locked down vestibule controlled with electric locks. We design windstorm rated windows in most of our coastal schools, this results in virtually bullet resistant glass at all openings. We fence playgrounds, install card-key access controls and place playgrounds immediately behind the school where possible. Virtually every new campus we have designed in the last decade includes CCTV systems. In industrial areas, we have even designed Air-conditioning systems that the Principal could shut-down with a single "push-button" to assure that a chemical release would not be a threat to the inside of the school by being "sucked into" the fresh air system without campus staff understanding that outside air was always automatically being brought into the building as required by the indoor air standards. We are now specifying "classroom locks"....locks which a teacher can lock from the "inside of their classroom, rather than having to open the door to lock the classroom lock for a shelter in place external threat.
A16A19	controlled access simple surveillance technological solutions
A16A20	Operable exterior windows for escape, locks on inside of classroom doors, fire sprinkler system, building code compliance.
A16A21	special hardware that creates an "exit only" passage during school hours. This hardware can be converted to ingress/egress at school opening/closing. Security cameras. Easily identifiable main entrance. Entry vestibule should direct all visitors into the reception area during teaching hours. There should not be direct access into the school.
A16A22	secured vestibule strong sense of entry cameras / monitoring system separate drop off zones for bus and parents clear lines of sight down corridors
A16A23	secured vestibule strong sense of entry comers / monitoring system separate drop-off zones for bus and parents clear lines of sight down corridors
A16A24	access control, # on outside of all ext. doors; visual access; video surveillance, and panic button and emergency plan
A16A25	cameras, card access, lock doors from intruders, visitors can only enter at office reception
A16A26	passive and active security measures; coordination with local first responders, implementation of safety educational programs
A16A27	cameras, p.a. system, windows, locking gates to separate facility
A16A29	safety vestibules
A16A30	secure vestibules, cameras, attention to restroom facilities and all public spaces, court yards, entrances and exits
A16A31	entry vestibule video surveillance fire alarm / sprinkler proximity alarm / security system traffic plan / layout no "deal" spaces
A16A32	security vestibule, cameras, clear circulation, separation of students and vehicles
A16A33	cameras, alarms, good security design, securable site perimeter
A16A34	clear organization and visibility (Transparency) into spaces for supervision
A16A35	comprehensive security management plan for the district that is realized in integrated system at each school
A2-5A36	-A comprehensive assessment of the safety of students and staff and the security of the campus -School Safety program
A2-5A37	security vestibules @ main entries

A2-5A38	cameras controlled access shut down school areas as needed
A6-10A39	Open views and sight lines should be incorporated as much as possible. A sense of entry that allows all visitors know where to go when they arrive on campus. the architecture needs to be married with strong procedures related to security, visitations, etc.
A6-10A41	Security, more cameras, no blind spots
A6-10A42	single secured main access point with clear visual control from main office classroom doors which lock from inside public address system to include a phone in each classroom
A6-10A43	clear fitting of vision, obvious entry, good circulation
A11-15A44	facilities that foster a cohesive social environment, including safety, visibility, a sense of community within the school, common use areas, areas arranged to allow for after hours and community use.
A11-15A45	passive safety design, teacher planning areas spread out w/view of corridors
A11-15A46	room accessibility facility supervision
A16A28	cpted

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