

2. ATTRIBUTES OF ENVIRONMENTAL QUALITY

"During the late Spring, the ambient temperature within the west-facing self-contained classrooms gets hot and stuffy for teachers and students alike. The teachers' desire and longing for natural daylighting, fresh air, spring breezes, and distant outdoor views have been overruled by more critical needs for security from potential intruders, which dictated the placing of metal grates on the now locked semi-transparent Plexiglas windows on the first floor." (Researcher observations)

Defining Environmental Quality

Environmental quality is difficult to define, and most people are aware of it only when they are not experiencing it. Typically, there are layers of environmental qualities that we experience that interact and create within us an overall feeling of ease or discomfort.

This study refers to environmental quality as the less easily definable, and more variable, qualities of the built environment that provide satisfaction to people, its sensory quality in all modalities; the positive and negative effects on human feelings, behavior, performance and meaning.

Environmental quality cannot be pre-conceptually defined but rather, must be discovered: hypotheses about it can be made on the basis of previous experience and insight to be gained through the study of the values, attitudes, and definitions of different groups in the context of a time and culture.

Previous research suggests that environmental quality is grounded on intimate knowledge of the ways people think and feel about environment. Environmental qualities represent or describe the resultant transactions between people and their physical, social and organizational environments.

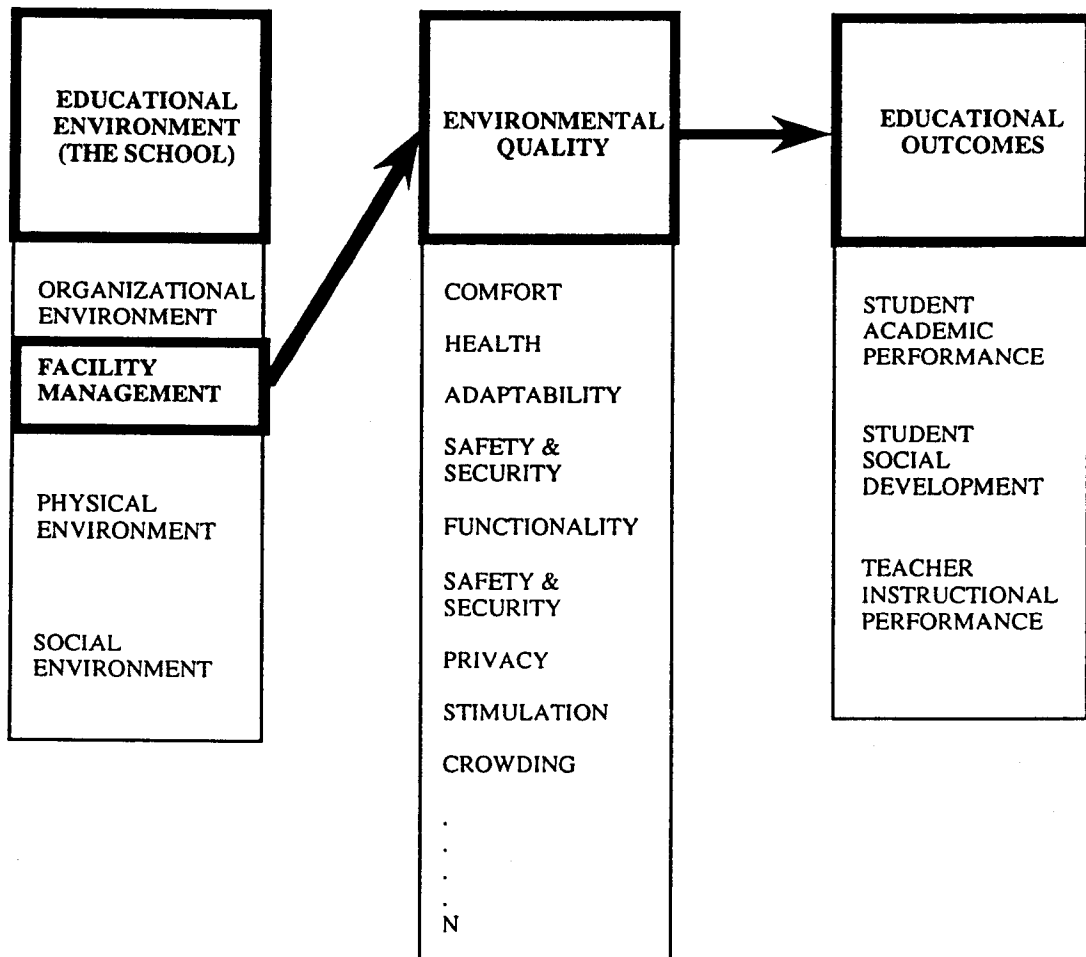
The Physical Environment as a Stage Set for Learning

The physical environment of the school should not be seen merely as a container for a variety of educational activities, but more profoundly as a dynamic stage set that creates and actively supports desired learning behaviors and activities.

Consider an actress who arrives on the stage during a live performance must rely on the physical stage set that provides her with cues, supports her with various props, frames her movements across the proscenium, through a door, or up a narrow staircase to the balcony. At times, the scenery may motivate the actress and even the audience into believing she is the character portrayed. The stage set changes with each new act to support yet another set of events to unfold for the audience, and with it, the mood, lighting, color, the whole atmosphere will be transformed, even though the exact same backdrop set elements may remain. Sometimes, only a new painting is hung, other times a window has new background scenery set behind it modifying one's perception and mood. The overall effect is of the feeling of a different place and time.

A similar process occurs day after day in the school: books change, activity centers relocate, partitions move; the seasons change and so do the displays, rooms are arranged for small group and large group activity; and as new students enter the same classroom, it becomes a different kind of place, even though the same teacher may reside there.

In this sense, the physical environment can be conceptualized as an integral component of the school; one that may have a profound influence upon the individual, the social setting of the school, and the organizational structure as well.



The approach of this study was to investigate the whole setting (organizational, social and physical environments) with special emphasis on the functions of facility management. Environmental quality was defined through the assessment process, beginning with researcher-defined attributes and ending with a subset of attributes as identified by school occupants within the context of locally perceived environmental concerns. Environmental quality is conceptualized as a mediating construct between the actions of facility management on the physical environment on one side, and educational outcomes on the other.

Environmental Concerns

As an outcome of the participatory environmental assessment process a set of environmental concerns surfaced (See Appendix B: Environmental Quality Concerns for a complete description of concerns in each school).

The number of environmental quality concerns ranged from 10 to 27, while the a subset of high priority issues ranged from 5 to 18.

When environmental concerns are categorized by occupants as partially attributable to facility management, match schools experience as much as 18% more concerns than JCI-managed schools.

Further, when only high priority environmental concerns are considered that are categorized by occupants as partially attributable to facility management, match schools experience as much as 38% more concerns than JCI-managed schools.

Ironically, JCI-managed schools averaged more environmental concerns per school (20) than match schools (12). Considering that the schools chosen for the public-private partnership were identified by the District as some of the schools with the greatest need of assistance, this last statistic is not completely unexpected. In fact, the school with the most environmental concerns, not perceived by occupants as attributable to facility management was School #142 that did not have the assistance of EAI until later in the program.

The corollary to these findings is that across all schools in the study, between 62-82% of environmental concerns are perceived by occupants to be either their own school's or their school district's responsibility to resolve or address, not facility management. Their response to these environmental concerns, some they have been acutely aware of prior to this study, is limited by clear budgetary considerations.

Environmental Perceptions of Students

Students of selected teacher participants were asked to complete a short five item survey of their favorite places in school for learning as well as what they liked and disliked about their classrooms in particular. When data is aggregated from the four schools who completed the student surveys a different pattern emerges.

Favorite Places

When students were asked what was their favorite place in their school they responded with this list (ranked from most to least responses):

1. Gym (95)
2. Classroom (40)
3. Computer Lab (18) (Only three schools in the sample that responded had computer labs)
4. Cafeteria (Lunchroom) (17)
5. Library (15)
5. Art (15)
6. Music (3)

The gym was by far the most favored space since students can run and play and "do whatever we want to do" as well as play basketball and other games. Some students enjoyed the spaciousness of the gym and the fact that they often learned new games and had music and parties on the gym. One student in School #25 enjoys the morning meetings that take place in her gym.

The classroom was the second most popular place in the school primarily due to the fact that students feel they "learn lots of fun things," get help on school work and have fun learning and playing games in the classroom. Some students in School #142 mentioned they enjoyed listening to music and watching movies in their classroom. Access to computers was a frequently mentioned reason for choosing the classroom as a favorite place in School #25. Students often mentioned they liked their teachers as well.

Students also enjoy the computer labs in their schools. They like to play games on the computer as well as learn to do math. They enjoy as they say "getting on the computer" which they see as a problem in their classrooms where computers are less available to students. A few students suggested that they each have their own computer at their desk.

The cafeteria is often mentioned by students as a place to eat, talk, play and clean-up. The lunchroom is perceived as a place where students feel they can unwind and be themselves; a place where they can get away with "running around" if they want to.

The library is also mentioned by students as a favorite place primarily for reading books and working on computers. The quiet atmosphere is another reason some students like the library. They often mention their dislike of other students talking while they are trying to read.

The art room is mentioned quite often as well, despite the fact that only three schools in the sample of surveys received have an art room. There are many students who enjoy drawing and artwork and are well aware of their talent in that area. They enjoy getting out of the classroom and into their art class where they can work on projects that interest them the most.

Other favorite places were school specific. Some other places included the Sylvan Learning Center in School #142, the office in School #31 and #32 where students often help adult staff, the Spanish lab in School #31 was a popular place, the CCC Lab in School #25, and the sandtable in a kindergarten class in School #25. One student suggested that he liked "everywhere" in the school.

Fun Places to Learn

When students are asked what are fun places to learn in their schools they respond as follows:

1. Classroom (87)
2. Gym (42)
3. Computer Lab (20)
4. Library (19)
5. Art Room (7)
5. Music Room (7)
6. Auditorium (2)

The classroom is by far the most recognizable place students associate with learning. They indicate that "teachers help me learn." Other reasons they choose the classroom as a fun place to learn is their friends are there, the rooms are pretty and nicely decorated, it is fun to go up to the board and solve math problems, they like their teacher, they learn role playing, listen to the teacher tell stories, enjoy math, spelling and reading (although not all the students enjoy these "tasks" as a few stated). One student in School #25 got all excited when he writes about "getting on the computer".

The gym makes a strong second as a fun place to learn. Many students in all schools mention the fun of learning new games especially basketball. A large majority of drawings students drew for the survey were of their performance on the basketball court in their gyms. In addition the basketball, students indicate they have physical education classes they enjoy where they learn to exercise.

The computer lab continues to be mentioned as well. Students indicate almost unanimously they enjoy learning math on computers. The library is a place where students say they can concentrate on their reading and other assignments. Art and Music rooms are also identified as places of learning as well; some students are very explicit about the fact that they learn while completing art and

music projects too. A few students in School #31 mentioned they learned to dance in the auditorium during a dance learning program offered by their school that Fall.

Other places students mentioned as places they enjoyed learning in included a reading lab in School #25, spanish class in School #31, one student in crowded School #142 enjoyed the hallway as a quiet place to go where he and his group could "cooperate." And again in School #142, students enjoy Sylvan Learning Center where they receive prizes and tokens for completing specific learning tasks.

Classroom Likes and Dislikes

When students are asked **what they like about their classrooms** they responded: I like

1. decorations on classroom walls (31)
2. to read books in class (25)
3. math (23)
4. using computers in their class (22)
5. playing games (20)
6. my teacher (18)
7. my friends (10)
8. writing (8)
9. lots of space to do things (8)
10. clean and organized classroom (6)
11. how my classroom is fun and exciting (5)
11. drawing (5)
12. my open classroom with no doors (4)
13. making things (projects) (3)
14. library centers and listening centers (2)
15. not noisy (1)
15. that we are allowed to talk softly (1)

Students clearly enjoy the aesthetics and appearance of their school. They are very aware of the sensory stimulation of their classroom. Teachers are aware of this and do a good job of providing a rich sensory experience for their students. It is also clear that they enjoy reading and math and using computers in class in addition to playing games. On the whole, students like their teachers and having their friends in class with them. In addition, they are aware of the orderliness and layout of their classroom. Finally, they understand that they are asked to be quiet, but appreciate being able to at least talk softly to their friends.

When students are asked **what they do not like about their classrooms** they responded: I do not like

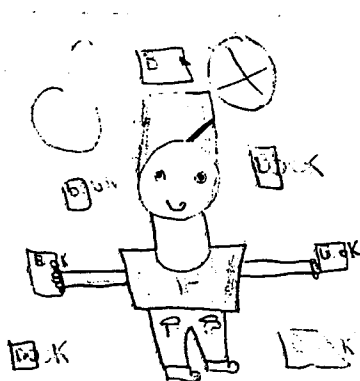
1. that my classroom has no walls, doors and that we are always being disrupted by other classes walking by (23)
2. other students in my class fighting, talking and being trouble-makers (18)
3. the noise from other classes (9)
4. that my classroom is not clean and trashy (9)
5. do not like reading (6)
6. that talking is not allowed (4)
6. the pictures on the walls (4)
6. that we have to do hard work sometimes (4)
6. writing (4)
7. my teacher (3)
7. that there are not enough computers in my classroom (3)

- 7. math homework (3)
- 7. staying after school (3)
- 8. classroom rules (1)
- 8. that we can't play games in class (1)
- 8. that the classroom is too cold (1)
- 8. that the classroom is too hot (1)

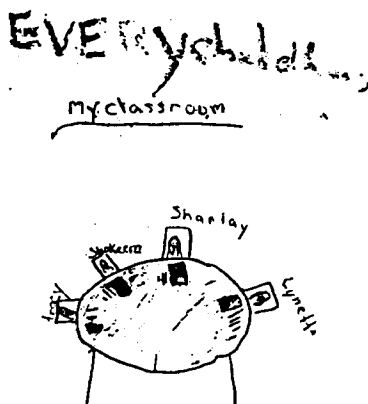
Students are keenly aware and most concerned about open space being too distracting. What makes this finding most significant is that these occurrences represent student concerns in only three of the four schools participating. This problem is high on teacher's list as well and reinforces their concerns.

Students are also preoccupied with the misconduct of their fellow students that distracts them further from their work. Noise from other classes accentuates this problem. In addition, many students do not like learning in a messy classroom.

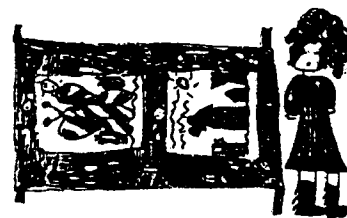
Of the remainder of reasons why students do not like their classrooms, the most striking is the lack of mentioning about thermal comfort issues. Only one student mentioned their classroom as being too cold, while another, in the same school (School #142) mentioned their classroom was too hot. This is the exact opposite finding from the perceptions of teachers who ranked physical comfort and health issues as their top priority. During interviews, many teachers and staff admitted that thermal conditions seem to affect them more than their students, but maintain that thermal conditions can influence student achievement and performance.



LIBRARY



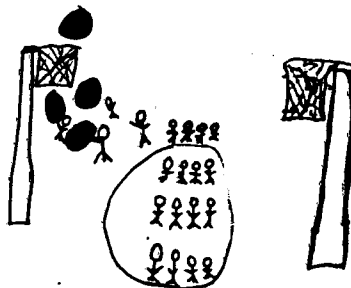
CLASSROOM



CLASSROOM



COMPUTER LAB



GYM



GYM

Attributes of Environmental Quality

Environmental concerns were classified throughout the assessment process as belonging to a class of experientially distinguishable environmental quality attributes such as comfort issues, safety issues, adaptability issues, etc. When environmental concerns are categorized as attributes of quality and ranked, a reduced set of critical environmental qualities emerge.

This study identified ten distinct attributes of environmental quality gained from interviews and workshops. These attributes are rank listed by the number of instances in which they are mentioned as issues or concerns by participants (the highest ranking environmental quality attributes were those that occupants felt they had the least influence over).

1. **Physical Comfort & Health** refers to the degree to which occupants feel the indoor environment meets their physiological needs with respect to thermal and air quality, illumination, noise and odors. Specific issues related to physical comfort and health might include classrooms that are either too hot or too cold, inadequately circulated air, lighting quality, acoustic and noise issues and unpleasant odors.
2. **Classroom Adaptability** refers to the degree to which occupants feel that the physical classroom space can be adapted to different and desired educational activities and functions. Specific issues related to Classroom Adaptability might include the inability to accommodate different furniture arrangements, inadequate room for instructional needs, problems with book, supply, student and personal storage, not enough display space, structural obstructions, etc.
3. **Safety & Security** refers to the degree to which occupants feel the school building contributes to protecting occupants from harm, injury, or undue risk. Specific issues related to safety might include slippery floors, unsafe playground equipment, emergency lighting, child safety in parking lots, while issues related to security might include poor outdoor lighting, unlawful entry of intruders, drugs, weapons, stolen items, or surveillance.
4. **Building Functionality** refers to the degree to which occupants feel the various places within the school building are functionally compatible with your school's educational programs and activities. Specific issues related to building functionality might include problems with conducting cooperative learning in open instructional space, adequacy of space size and configuration of classrooms, assembly spaces or other spaces within the school.
5. **Aesthetics & Appearance** refers to the degree to which occupants feel the school building is attractive and provoking. Specific issues related to aesthetics & appearance might include the appearance and upkeep of the exterior of the building, the visual appearance of the building entrance and lobbies to visitors, cleanliness of floor, wall and ceiling surfaces, the orderliness and cleanliness of classrooms, etc.
6. **Personalization & Ownership** refers to the degree to which occupants feel the school building offers opportunities to create a personal and self-expressive environment and engender a sense of ownership. Specific issues related to personalization and ownership might include student work displays, ability of individual students to personalize desks and work areas, personal lockers,

personalization of classrooms by teachers, parental volunteerism, neighborhood residents respect school grounds, etc.

7. **Places for Social Interaction (Social Places)** refers to the degree to which occupants feel that places within the school building provide opportunities for meaningful social exchange and interaction. Specific issues related to social places might include classrooms that do not provide opportunities for small group instruction, places in the school that promote informal social exchange such as a lobbies, hallways, restrooms, and playgrounds, etc.
8. **Privacy** refers to the degree to which occupants feel that there are places within the school building which provide opportunities for an individual or a small group to be free from the intrusion of others. Specific issues related to privacy might include the availability of places to have private conversation, to be alone for a short moment to collect your thoughts, and/or places for students to be alone for a few minutes.
9. **Sensory Stimulation** refers to the degree to which occupants feel the school building provides a stimulating environment for learning that is safe yet challenging. Specific issues related to sensory stimulation might include brightness and cheerfulness of classrooms, hallways, assembly spaces, inspiring and creative wall displays, visually exciting learning spaces, a variety of textural changes and colors, etc.
10. **Crowding/Spaciousness** refers to the degree to which occupants feel the school building cannot adequately accommodate the number of students and teaching staff occupying it. Specific issues related to crowding/spaciousness might include problems with overcrowding in classrooms, congested hallways, lobbies, administrative offices and other spaces in the school building.

Of these ten attributes of environmental quality⁴, five are seen as being of highest priority across the five schools in this study:

1. **Physical Comfort & Health**
2. **Classroom Adaptability**
3. **Safety & Security**
4. **Building Functionality**
5. **Aesthetics & Appearance**

Note that this list represents an aggregate of all the five schools in the study. Not all schools in the study rank the environmental quality attributes the same, although there are clear patterns that have emerged represented by the top five list above. School #142 for instance ranks functional adaptability nearer to the top, while School #138 is more concerned with safety and security. If other schools were to be investigated, other rankings may emerge depending on the particular context and circumstances the school finds itself in.

⁴ See Appendix A: Attributes of Environmental Quality for a full description of all ten environmental issues identified in the study).

1. Physical Comfort & Health

Physical Comfort and Health is the most often discussed environmental quality of concern in the study. According to most teachers, physical comfort and health concerns are experienced either daily (32%), weekly (37%), or monthly (22%). The following is a list of physical comfort and health issues that were identified by working groups.⁵

- poor air flow and ventilation are seen as potentially contributing to many health-related problems in the school (25, 31, 138, 142)
- noise and distraction problems are seen as either a low or moderate priority in open instructional areas (25, 31, 138, 142)
- cold zones in air-conditioned buildings are of constant concern (31, 138, 142)
- poor bathroom ventilation, due primarily from ineffectively operating ceiling fans, is causing some minor odor concerns (138, 142)
- old carpeting, especially at lower grade levels where students sit on the floor, is seen as a health concern (31, 32)
- excessive heat in the months from May through September is a concern for the one school without central air-conditioning (32)
- acoustic problems in bathrooms and corridors may be due to an over abundance of hard surface materials and the absence of sound absorbing materials such as acoustical ceiling tile and carpeting (32)
- concern over the scope of custodial responsibilities with respect to cleaning classroom counters (32)
- plumbing and drainage system has on a few occasions failed to prevent first floor flooding causing a potential health risk (142)

Although most teachers surveyed feel they have **little to no control (65%)** over the physical comfort and health concerns at their school, and despite the feeling that physical comfort and health concerns have been **somewhat hindering (44%)** in providing an effective environment for teaching and learning, teachers feel that the manner in which physical comfort and health concerns have been dealt with at their schools has been **somewhat fair (45%)**.

Overall, only **26%** of teachers indicated they were **somewhat to very disappointed** with respect to how physical comfort and health concerns have been addressed.

A majority of teachers feel that physical comfort and health is **very important (65%)**, in supporting the goal of maintaining a safe, healthy and nurturing learning climate, and **very important (56%)** in supporting the goal of increasing Student Academic Performance.

⁵Each issue is ranked by the designated school number mentioning that issue. Schools identifying a particular issue are noted in parentheses.

2. Classroom Adaptability

Half of teachers responding to the survey indicated they are having problems with issues of classroom adaptability. Teachers experience problems on either a daily (14%), weekly (25%), or monthly (11%) basis.⁶

The following is a list of classroom adaptability issues identified. Each issue is ranked by the number of schools mentioning that issue.

- concerns over the effectiveness and adaptability of open plan versus self-contained classrooms (25, 142)
- computer installation and other problems limit classroom adaptability (32, 142)
- the need for additional storage space options (25)
- size and number of classroom tables seen as limiting options for self-contained classroom layout (32)
- inability to hang displays from concrete block walls limits available wall space (32)
- the need for additional electrical outlets in classrooms (31)
- difficulty conducting inter-class projects (32)
- problems with cooperative learning instruction in self-contained classrooms (32)

An equal percentage of teachers feel they have little control over the classroom adaptability at their school as do those who feel they have significant control. However, only **38%** of teachers feel that the manner in which classroom adaptability concerns have been dealt with at their schools has been **fair or somewhat fair**, as well as **somewhat to very helpful (30%)** in providing an effective environment for teaching and learning.

Overall, **50%** of teachers are **somewhat to very pleased** with how classroom adaptability concerns have been addressed at their school.

A slight majority of teachers feel that classroom adaptability is either **very important (52%)**, or **somewhat important (34%)** in supporting the goal of maintaining a safe, healthy and nurturing learning climate, and either **very important (55%)**, or **somewhat important (31%)** in supporting the goal of increasing Student Academic Performance.

⁶See Appendix A for a detailed summary of all survey results referred to in this section.

3. Safety & Security

Of all the ten attributes of environmental quality, Safety and Security was the most often mentioned high priority concern for all five schools. Most teachers indicated they experienced safety and security problems on a regular basis. No respondent claimed to never having experienced a safety and security concern. According to teachers, safety and security issues occur most often on a weekly (33%) or monthly (41%) basis.

The following are a list of safety and security issues identified.

- concerns over neighborhood quality seen as compromising school safety and security (25, 31, 32, 138, 142)
- unsafe playgrounds and playground equipment contribute to safety problems (25, 31, 32, 138, 142)
- concerns over intruders and securing multiple points of entry (31, 32, 138, 142)
- poor outdoor lighting near parking lots encourage safety and security problems (25, 31)
- psychological safety on the building grounds (25, 138)
- child safety with parking lot vehicular traffic (32, 142)
- locked and semi-transparent windows increase security, but compromise visibility and daylight (32, 142)
- lack of garbage pick-up around dumpsters contributes to safety problems for students who play in the area (32, 138)
- inadequate emergency lighting in stairwells a safety risk (31)
- deterioration and lack of maintenance of city alley behind school a safety concern (25, 32)
- poor upkeep of grounds seen as a potential safety concern (31, 138)
- congested main stair during arrivals and dismissal may compromise safety (138)

Despite the relatively high perceived frequency of safety and security issues, most teachers feel they have **some control (55%)** over their personal safety at their school. In addition, **69%** of teachers feel that the manner in which safety and security concerns have been addressed have been **fair to somewhat fair**, as well as **somewhat helpful (41%)** in providing a safe environment for teaching and learning. Overall, **50%** teachers are **somewhat to very pleased** with how safety and security concerns have been addressed at their school.

A majority of teachers surveyed feel that safety and security is **very important (72%)** in supporting the goal of maintaining a safe, healthy and nurturing learning climate, and **very important (64%)** in supporting the goal of increasing Student Academic Performance.

4. Building Functionality

Sixty-four percent of teachers experience problems with building functionality. Most teachers encounter building functionality issues daily (25%) and weekly (21%).

The following is a list of building functionality issues identified.

- concerns with compliance with ADA Accessibility laws (Americans With Disability Act) (25, 31, 32, 138)
- lack of both playground equipment and an adequate tot lot area are seen as limiting functional use of the building grounds (138)
- congestion in the main stair during morning arrivals and dismissals compromises efficient circulation and movement (138)
- an underutilized library/media center limits effective building functionality (142)
- problems with parents finding way to child's classroom may be a consequence of unclear functional layouts and signage (142)
- unorganized central storage room limits functionality (142)
- crowded administrative area not functional (142)
- inadequate lobby design creates some functional problems (142)
- mismatch between community school vision and facility layout (142)
- inadequate furnishing of the teachers' lounge (31)
- cafeteria/auditorium divider partition in disrepair (31)
- lack of assembly space severely limits for school-wide activities (142)

Most teachers feel they have **little or no control (69%)** over the building functionality at their school. In addition, **41%** of teachers responding to the survey feel that the manner in which building functionality concerns have been dealt with have been **fair to somewhat fair**, as well as **somewhat to very hindering (38%)** in providing an effective environment for teaching and learning. Overall, only **31%** of teachers are **somewhat to very pleased** with how building functionality concerns have been addressed.

A majority of teachers feel that building functionality is either **very important (52%)**, or **somewhat important (34%)** in supporting the goal of maintaining a safe, healthy and nurturing learning climate, and either **very important (55%)**, or **somewhat important (31%)** in supporting the goal of increasing Student Academic Performance.

5. Aesthetics & Appearance

Sixty-nine percent of teachers responding to the survey claim to experience concerns over aesthetics and appearance of their school. The frequency of experience is broad ranging from daily to weekly (30%) and monthly to yearly (38%).

The following is a list of classroom adaptability issues identified.

- the appearance of existing playgrounds is of concern (25, 31, 32, 138, 142)
- semi-transparent windows are seen as unsightly (25, 31, 32, 138, 142)
- concern over the upkeep of the school grounds (25, 31, 138)
- concerns over the poor appearance of the neighboring property and city alley (25, 32, 138)
- old carpeting is seen as hindering the appearance of the school (31)

Two issues that were brought up but not of concern were:

- the interior of the school is perceived as clean and orderly (25, 31, 32, 138)
- interest in landscape projects as a way to improve the appearance of the grounds considered (142)

Seventy-three percent of teachers feel they have **some to significant control** over the aesthetics and appearance concerns at their school. Supporting this finding is that the same **73%** of teachers feel that the manner in which aesthetics and appearance concerns have been dealt with have been **fair to somewhat fair**, as well as **very to somewhat helpful (62%)** in providing an effective environment for teaching and learning.

Overall, **77%** of teachers are **very to somewhat pleased** with how aesthetics and appearance concerns have been addressed.

A majority of teachers feel that aesthetics and appearance is either **very important (64%)**, or **somewhat important (32%)** in supporting the goal of maintaining a safe, healthy and nurturing learning climate, and either **very important (56%)**, or **somewhat important (30%)** in supporting the goal of increasing Student Academic Performance.