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# Building Schools That Are Responsive To Student Learning

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**Abstract:** This study analyzed perceptions regarding newly created facilities to staff and student needs and the enhancement of learning. Inclusion of future occupants in the planning was rare. This study investigated: 1. perceptions of the educational structure's ability to meet the programming needs of students; 2. perceptions of the building's impact on the academic achievement of students; 3. the role of evaluation in planning of the school building; 4. perceptions regarding the responsiveness of the facility; and, 5. differences in perception between the participating districts. Findings indicate significant differences in perceptions regarding the responsiveness of the new facility. Responses revealed district size was a critical factor in the use of a facility task force. Formal evaluations of building designs were conducted only after the buildings were occupied.

# Building Schools That Are Responsive To Student Learning

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"We shape our buildings and thereafter they shape us"

- *Winston Churchill*

To the casual observer it may be a logical assumption that educational structures need to be designed with the intention of meeting the programming needs of students (Hedley & Brokaw, 1984). Yet, extant literature has clearly indicated that few educational facilities are constructed with this ultimate goal included in the overall vision of the project (Moore & Lackney, 1994). In the 1996 study conducted by Chan, relating to the school environment's impact on student learning, his findings clearly demonstrated that the design of a building can have tremendous impact on student learning and the instructional process can be enhanced or severely undermined based on the facility design.

While limited research has been conducted on the processes and procedures of building and opening a new school (Earthman, 1992), the investigations that have been done in this area indicate that building an educational edifice is a multifaceted task involving numerous individuals with varying interest levels in the project (Earthman, 1986; Moore & Lackney, 1994; Nagakura & Moronuki, 1986; Norris & Poulton, 1991). According to Day (1998), effective planning requires an understanding of what has occurred in the past as well as what needs to transpire in the future. Additionally, stakeholders involved in the planning and designing process need to perceive a historical perspective of the informal/formal planning actions that have occurred within a school district (Norris & Poulton, 1991).

One of the most critical components in the overall design process of creating an

educational edifice requires the development of instructional specifications for facility use (Earthman, 1986). These specifications provide a road map for the basic design of a building, which includes a fundamental floor plan, elevation or sectional design, structural plan, facilities scheme, construction method blueprint, school furniture formula, color scheme, and an outside drainage plan (Nagakura & Moronuki, 1986). Additional considerations include checkpoints for structural soundness of the facility, economic considerations of the building, as well as the physiological aspects, durability, and of course, the attractiveness of the structure. Particularly important to a school are conditions for outdoor activities, location and proximity of classrooms and entrances and exits (Constantinos, 1988; Nagakura and Moronuki, 1986).

To build a facility responsive to the programming needs of the students and staff members, work in this area has shown that the future occupants (e.g., teachers and students) must partake in the planning and designing of the facility (Hedley & Brokaw, 1984). The educational structure does not merely house the students and the staff, but conceivably can balance the needs of the students with the teaching styles of the staff members (Sanoff, 1996). This is why the evaluation process is also a critical component in this process. If an evaluation does not occur following the occupation of the building, valuable information to assist in future building projects may be irretrievably lost (Earthman, 1992; Hammond & Schwandner, 1998). It is this adaptation or fit between the structural layers within the organization and the daily practices of the members of the organization that causes a project to be successful or unsuccessful (Bolman & Deal, 1997). Continual input by the future stakeholders throughout the planning and designing phases of the facility will allow decisions to be made causing the stakeholders to develop a sense of ownership for the building (Chan, 1996). Yet, according to Day (1998), inclusion of future users rarely occurs.

Research has indicated that receiving input from future occupants through the process of building an educational structure has an impact on student learning as well as facilitating occupant ownership (Chan, 1996). Although the process may appear systematic and sequential, limited research has been conducted on the actual procedural techniques utilized by school districts to build a school building (Sanoff, 1996). It is this process that this study was particularly interested in investigating. Specifically, it was important to know: 1. What were the perceptions of key stakeholders in the educational structure's ability to meet the

programming needs of students? 2. What were the perceptions of key stakeholders of the building's design and that design's impact on the academic achievement of students? 3. What was the role of formal evaluation in the planning, building and completion of the school building? 4. Was there was a difference in the perceptions by teachers and ancillary staff members regarding the level of responsiveness of the new facility? and 5. Was there a difference in perception by teachers and ancillary staff members between the three participating districts.

## Conceptual Underpinnings of the Study

### *Facility planning is both an art and science*

Historically, schools have emanated from a basic structure housing children and teachers from inclement weather to become a complex technological environment supporting a variety of programs (California State Department of Education, 1991). Once the need for a school has been established, the process for planning, designing, and constructing the facility begins (Ortiz, 1992). While schools are being planned and built all the time, limited empirical research has been conducted in the area of school facility design and planning (Day, 1998). The literature that does exist routinely speaks about architects as primarily in charge of designing educational facilities with little or no input from educators (Goldberg, 1991). This overall lack of communication between the architect and the professional educators has resulted in tenuous outcomes, many times with buildings being constructed that do not meet the programming needs of students (Day, 1998). Holy and Arnold (1936), in their book on standards for evaluating school buildings, stated that educational facilities have been constructed with limited involvement interfacing the programming aspects to the physical plant.

The process of designing, planning, and constructing a school facility has been chronicled as a systematic and cyclical process with four major components (Almedia, 1988). These included: 1. Analysis and diagnosis, 2. Research and development, 3. Planning and programming, and 4. Implementation and evaluation (1988, p. 97). Yet, the actual process becomes a cultural system, a chain of interrelated actions, whereby the structure is in a constant state of flux, due to changes in the status of individuals and repetitive changes within the organizational composition (Beals, Spindler & Spindler, 1967). This often results in little communication between essential parties in the building's design and future

outcomes (Day, 1998). Optimally, the process should center on meeting the programming needs of the students (Sanoff, 1996). Yet, in most instances they are only an afterthought (Hedley & Brokaw, 1984).

Aside from traditional school planning roles and current paradigms of school building design, financial limitations by school districts have also played a crucial role in inadequate facility design and construction as well (Chan, 1996). According to Earthman (1986), inferior planning for a new facility is expensive and will usually prevail for the duration of the building. The old adage, "You get what you pay for," holds true especially for poorly planned and inadequately built educational facilities. Deteriorating buildings with leaky roofs and inadequate thermal adaptations can be located throughout the United States (Byrne, 1990).

## Effects of Design on Student Performance

While it may not be as readily evident as a school's publicly reported test scores, deteriorating and inadequate facilities impact how well students do in school. Research has pointed to the fact that students' academic achievement is higher in newer and more attractive school buildings than in less attractive facilities. Location of the buildings is deemed important as well. Students with similar backgrounds, located in schools near busy and noisy streets versus students who attend school in newly created buildings with lower noise levels, achieve higher test scores (Chan, 1996). A few investigations examined issues such as the size of the classroom, aesthetic features, and climate factors within the school setting and the effect on student performance with few implications on current trends (Moore & Lackney, 1994). Recent research in this area has begun to explore the connection between school facility age and its appearance to student academic success (Meek, 1995) as well as school design and student and staff responsiveness (Riggs, 2000). For example, the California State Department of Education (1991) reported, "the facility could hinder or enhance the educational program" (p. 12). This and other investigations have motivated educational leaders to become aware of "the direct relationship between space and function" (1991, p. 12).

In this investigation, key informants' views and perceptions regarding the process of designing and building an educational edifice were explored. It was also important to know whether faculty and staff felt the building was responsive to student programmatic and

instructional needs.

## Method

Deriving meaning from the creation of an educational structure, the processes involved, and how the completed structure relates to student achievement required gathering information from the perspectives of the individuals involved. Investigations in this mode attempted to understand "the meaning of events and interactions to ordinary people in particular situations" (Bogdan & Biklen, 1998, p. 23). It was this interpretation of the actions of the participants in three separate school districts in a midwestern state that provided the basis for this study.

This exploratory study was conducted in two phases. The first phase consisted of open-ended and in-depth interviews with key informants regarding their perceptions of the planning and building process. The second phase consisted of administering surveys to teachers and staff in order to investigate their perceptions on the level of responsiveness of the newly built facilities to student and staff needs.

## Sample

Three school districts located in a midwestern state with student populations ranging from 10,000 to 25,000 were used in this investigation. These schools were chosen because a new educational structure had been constructed in each district within the past four years. Because this study employed qualitative methods requiring multiple visits, proximity of each of these districts to the home of the lead author was also a consideration in their selection.

Once each of the three school districts had been identified, the superintendent was contacted by phone and then by mail. Upon receiving approval from the district office, a letter was mailed to each of the facility planners, architects, and building administrators identifying the study and its focus. Following the mailing, phone calls were made in order to establish an appointment for face-to-face interviews.

Phase One. In-depth, semi-structured interviews (Bogdan & Biklen, 1998) were conducted with three facility planners, three architects, and three building administrators. In one district, the chairperson of the facility task force was also interviewed. The lead author conducted all interviews. The purpose of these interviews was to explore these informants' perceptions of the planning, building and eventual evaluation of each of the school buildings. Example questions posed to the participants included: (a) Did you participate in discussions

concerning creating a building that would meet the programming need of students and staff? (b) Do you perceive that the current building enhances the academic achievement of students? What do you base that on? (c) What role did the future occupants play in the discussion of building specifications and design? (d) What role does evaluation have in the planning, building, and completion of the educational edifice?

Phase Two. Upon completion and analysis of the interviews, a questionnaire based on prominent themes from the interviews, as well as extant literature, was designed (See Figure 1). A renowned local architect reviewed the Facility Evaluation Questionnaire (FEQ) and it was field tested by a school district in another part of the state that had recently completed an elementary school building. Data from this pilot was subjected to a test-retest method of analysis, which was employed to confirm the reliability of the instrument. The Facility Evaluation Questionnaire (FEQ) is a 39-item instrument that measures four primary dimensions involved in building a school (Riggs, 2000). A Likert-type scale, which ranges from 1= Inadequate to 5 = Extremely satisfactory, was used to collect the participants' reactions. The dimensions and internal consistency estimates based on the test-retest analysis are grounds (.82), shared amenities (.84), classrooms (.88) and equipment (.84). Representative examples of items on the FEQ include: (a) classrooms have adequate space for large and small group discussions, (b) classroom technology is provided, (c) hallways are spacious for easy movement between classes, (d) design of the facility positively impacts student achievement.

A demographic section was also included which permitted the investigators to query participants on issues of where they were employed, the date that the staff member completed the questionnaire, their current position, number of years in the district, participation in the building planning, and status as an original staff member.

The Facility Evaluation Questionnaire (FEQ) was administered to the current occupants of the three participating buildings used in this study. Of the 145 school personnel contacted, 88 useable questionnaires were returned, which yielded a response rate of 61%. Descriptive statistics of survey participants are presented in Table 1.

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TABLE 1

Descriptive Statistics of Participants (Teachers and Staff) in the Three New Schools.[1]

| Participants | School One | School Two | School Three | **Totals** |
|---|---|---|---|---|
| **Position** | | | | |
| Teachers | 16 | 26 | 22 | **64** |
| Counselors | 1 | 0 | 1 | **2** |
| Librarians | 1 | 1 | 1 | **3** |
| Nurses | 1 | 1 | 0 | **2** |
| Support Staff | 10 | 4 | 3 | **17** |
| **Totals (by school)** | **29** | **33** | **26** | **88** |
| **Years in the District** | | | | |
| Mean | 11.07 | 6.88 | 10.12 | **9.22** |
| Standard Deviation | 7.14 | 6.13 | 9.16 | **7.65** |
| **Participated in Planning** | | | | |
| Yes | 0 | 7 | 8 | **15** |
| No | 29 | 26 | 18 | **73** |
| **Original Staff Members** | | | | |
| Yes | 24 | 23 | 14 | **61** |
| No | 5 | 10 | 12 | **27** |

Note: (N=88 School Personnel)

## Analysis

Interview Data

The focus of the investigation was to explore key stakeholders' perceptions of the planning, building, and eventual evaluation stages of each of the school buildings

participating in this study. The primary focus of this study was to investigate the views of participants regarding the level of their satisfaction with the newly created edifice and its responsiveness to student and staff needs, and more importantly, whether the design helped to enhance student learning. The interviews were also designed to have key stakeholders reflect on the process of planning and building, the involvement of future occupants, and the role of evaluation throughout the process.

In order to address these issues, in-depth, semi-structured interviews with ten key informants were conducted (Bogdan & Biklen, 1998). Participants included three facility planners, three architects, and three building administrators and in one district, the chairperson of the facility task force. All interviews were conducted in person by the first author. Data collection and analysis occurred simultaneously and continued throughout this part of the study (Glaser & Strauss, 1967). Ongoing analysis influenced the focus and direction of succeeding interviews. The process of open coding (Strauss & Corbin, 1990) guided the analytic procedures.

Survey Data

In this study, staff members were chosen as the unit of analysis to investigate individual perceptions. Teachers and school staff (N=88) where chosen to respond to the 39-item Facility Evaluation Questionnaire (FEQ). The FEQ was developed to measure four primary dimensions involved in building a school (Riggs, 2000). Dimensions measured by the FEQ are: school ground, shared amenities, classrooms, and technology/equipment.

The data from responding school personnel were used to investigate the following three research questions. The first question investigated the differences in perceptions by the teachers and ancillary staff members regarding the responsiveness of the new facility. The second question examined the differences in perceptions by teachers and ancillary staff members between the three participating buildings. The final question explored the difference in perceptions by the teachers and ancillary staff of the three schools. Variables were submitted to a mixed design ANOVA (analysis of variance) with a between groups factor of school (three levels) and a within groups factor of scale (five levels) to assess the nature of the effects.

## Discussion

First, the limitations of this investigation. The empirical results are based on the

perceptions and self-reports of 88 teachers and school personnel and interviews with ten key informants. Participating districts were selected based on their recent building of an educational structure and their geographical proximity to the lead author. A return rate of 61% appeared to be a fair representation of the three selected sites. In order to provide a thorough analysis of the topic, a mixed design of survey use, triangulated with interviews of key stakeholders was utilized. Additionally, while numerous interpretations of the data are included in the report, there may be other plausible explanations for the data that are reported here.

## Findings

Interviews with the key stakeholders provided commonalties in perspectives with one exception – involvement of current occupants in the planning phase. Using the research questions and extant literature as a guide, analysis of the interview data resulted in findings that clustered around three central areas: 1. future occupants, 2. student needs and achievement, and 3. evaluation.

Future occupants: The role of current occupants varied greatly among the three buildings participating in this investigation. While the current administrators (principals) were included in the process before any staff members, no school personnel were involved until after the architect had been selected and the design of the building was well underway. While the literature has clearly indicated the need to involve educational personnel in the planning and design of schools (Chan, 1996), interviews with the facility planners indicated otherwise. On several occasions throughout the interview sessions, key informants articulated confidence that current occupants had been included from the very beginning of the designing and programming phases of the process. However, results from the school personnel surveys and information from other informants indicated otherwise. During follow-up interviews with the architects and facility planners, responses indicated they were surprised with this evidence, although the leader of the facility task force was clearly aware that current occupants had not been involved.

> I did not realize that current occupants were not included in the discussions concerning the design of the building. I thought they were all included because we met with a large group of parents and teachers to plan the building. (Architect 1).

> None of the facility task force included current occupants. (Lead, Facility Task Force)

Student needs and achievement: Research has indicated that the newness of a building and its physical appearance can have an impact on student learning and achievement (Chan, 1996; Sanoff, 1996). Responses from the key stakeholders indicated they all felt the buildings were responsive to student needs and achievement. Yet, they also admitted that neither they, their respective firms, nor the school had conducted any systematic means for determining whether or not the design had any affect on student learning. The facility task force chair's comments are representative of the opinions expressed by the participants:

> Well, everything must be taken into context when you are working with a budget, and what you really would like to have had and what you wind up with are two different things. It's a delicate thing, you can't turn a committee loose to start designing the ultimate building because it will be 50 to 100% more than you can afford … When the money is not there for it, the whole overall structure that you originally started with may be altered (Facility Task Force Chair).

These comments resonate with earlier research that articulated that financial limitations by school districts have also played a crucial role in inadequate facility design and construction as well (Chan, 1996).

Evaluation: The area of evaluation is ignored by most school districts although it represents one of the most pivotal domains of the facility project (Earthman, 1992). When key stakeholders participating in this study were queried about the building design and its responsiveness to the needs of students and student achievement, most responded they perceived their school to meet the needs of students. Yet, when further probed on what they based this perception, responses from all of the participants indicated that none of the schools had conducted any type of formal evaluation. The following question-answer sequences are from interview transcripts and are generally representative of overall responses by participants:

*Q: What role does evaluation have in the planning, building, and completion of the educational edifice?*

> R: "A very important one" (Architect, Building 1).

R: [Evaluation] "should have a major role, but through the years, it's had a very minor role" (Administrator, Building 1).

*Q: Did you conduct a formal evaluation?*

R: "No, we did not do a formalized evaluation" (Architect, Building 1).

R: "We didn't do any type of evaluation" (Administrator, Building 3).

The evaluation process is the most important portion of the construction process. If an evaluation does not occur following the occupation of the building, valuable information to assist in future building projects may be irretrievably lost (Hammond & Schwandner, 1998).

Questionnaire Data

The research questions for this study focused on the creation of an educational structure which was deemed responsive to student and staff needs, as viewed by the key stakeholders involved in planning the new facility and the current occupants of the building. Factors pertaining to the staff members included their experience, whether or not they were an original occupant, had participated in the planning process, and were certificated or non-certificated.

Building by Scale Analysis

A mixed design ANOVA (Analysis of Variance) Test was completed with a between groups factor of school (three levels) and a within groups factor of scale (five levels) to assess the nature of the effects. The main effect of school was significant $F(2, 85) = 7.78$, $p = .001$. Further analysis revealed that both the scale effect $F(3, 255) = 21.015$, $p = .000$ and school by scale effect were significant $F(6, 255) = 4.873$, $p = .000$ (See Table 2).

TABLE 2

ANOVA Source Table for Building by Scale Analysis

| Source | df | MS | F | Sig |
|---|---|---|---|---|
| Between Groups | | | | |

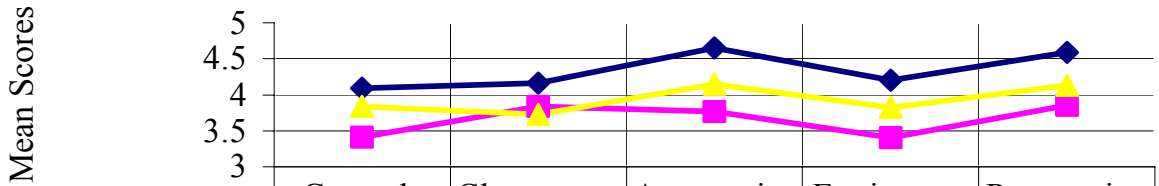
| | | | | |
|---|---|---|---|---|
| School | 2 | 14.155 | 7.78 | .001* |
| Error | 85 | 1.819 | | |
| | | Within Groups | | |
| Scale | 3 | 3.078 | 21.015 | .000* |
| School by Scale | 6 | .714 | 4.873 | .000* |
| Error | 255 | .146 | | |

Note: *$p = .05$

The main effect of school was significant F (2, 85) = 7.78, p = .001 with the means for School One, M = 4.342; School Two, M = 3.654; and School Three, M = 3.934. Figure 2 represents the overall mean scores of all participants by school building: Grounds, M = 3.761; Classrooms, M = 3.913; Amenities, M = 4.175; Equipment, M = 3.792; and Responsiveness, M = 4.176.

Responses indicated that both teachers and non-certificated personnel in, Schools One and Three ranked the shared amenities as the highest of all five areas, while personnel in School Two ranked the classrooms and overall levels of building responsiveness the highest. Evidence strongly suggests that personnel in School One ranked the classrooms low because of the small size of the classrooms and limited storage capabilities (Interview with the Assistant Superintendent for Elementary Education, Building One, December 1,1999). School Two ranked grounds and equipment as the two lowest areas primarily due to deficient landscaping, lack of parking, lack of a bus lane, and equipment arriving late (Interview with Building Two Administrator, November 9, 1999). School Three ranked classrooms the lowest, also due to small size (Interview with Building Three Administrator, November 5, 1999).

Figure 1.




| | Grounds | Classrooms | Ammenties | Equipment | Responsive |
|---|---|---|---|---|---|
| School 1 | 4.09 | 4.16 | 4.65 | 4.2 | 4.59 |
| School 2 | 3.41 | 3.84 | 3.77 | 3.4 | 3.85 |
| School 3 | 3.84 | 3.73 | 4.15 | 3.82 | 4.13 |

Position by Scale by School

The position category was coded utilizing two different methods. Initially, under the variable position, the staff members were identified by numerical rankings for the following positions: teachers, counselors, librarians, nurses, aides, secretaries, custodians, and food service employees. This was completed in order to sort the various members for the three schools. An additional coding was completed under the variable Pos2 in order to collapse the data into the two categories: certificated (teachers, counselors, librarians, and nurses) and non-certificated (aides, secretaries, custodians, and food service employees). The coding made the data matriculation easier for coding and comparative purposes.

Utilizing the Analysis of Variance (ANOVA) procedure, the effect of position by scale was significant $F(1, 82) = 8.22$, $p = .005$. Further analysis revealed that between groups of school by position was significant as well $F(2, 82) = 3.73$, $p = .028$. Within groups of scale by position posted significance $F(4, 328) = 7.13$, $p = .000$ and scale by school by position was significant $F(8, 328) = 6.02$, $p = .000$ (See Table 3).

TABLE 3

ANOVA Source Table for Position in the Building by Scale by School

| Source | df | MS | F | Sig |
|---|---|---|---|---|

| | | | | |
|---|---|---|---|---|
| | | Between Groups | | |
| School | 2 | 19.73 | 9.10 | .000* |
| POS2 | 1 | 17.83 | 8.22 | .005* |
| School by POS2 | 2 | 8.09 | 3.73 | .028* |
| Error | 82 | 2.17 | | |
| | | Within Groups | | |
| Scale | 4 | 1.63 | 9.87 | .000* |
| School by Scale | 8 | 1.02 | 6.19 | .000* |
| School by POS2 | 4 | 1.18 | 7.13 | .000* |
| Scale by Sch by POS2 | 8 | .994 | 6.02 | .000* |
| Error | 328 | .165 | | |

Note: *$p = .05$

There were differences noted in the marginal means of position collapsed across school (Non-certificated, School 1, M = 4.151; School Two, M = 3.669; School Three, M = 2.506) and (Certificated, School One, M = 4.443, School Two, M = 3.651,School Three, M = 4.053). The marginal means of the scaled scores, collapsed across the three schools, is recorded with the non-certificated mean scores reported first and the certificated mean scores included second. (Grounds, M = 3.574 and M = 3.806; Classrooms, M = 3.758 and M = 3.950; Amenities, M = 4.270 and M = 4.153; Equipment, M = 3.595 and M = 3.839; and Responsiveness, M = 3.882 and M = 4.246). When reviewing the overall mean scores, collapsed across the three schools by position, it would appear that the certificated staff members at all three schools were more satisfied with all aspects of the facilities, with the exception of the school amenities which included the kitchen, all purpose room, library, restrooms, and office areas.

Figure 3 represents means for non-certificated staff members' responses for the three participating schools. Figure 4 represents the overall means for certificated staff members'

perceptions of the various areas for the three new schools. In order to examine the perceptions of various school personnel, mean scores were calculated for both certificated and non-certificated staff members. (See Figures 2 & 3)

Figure 2.

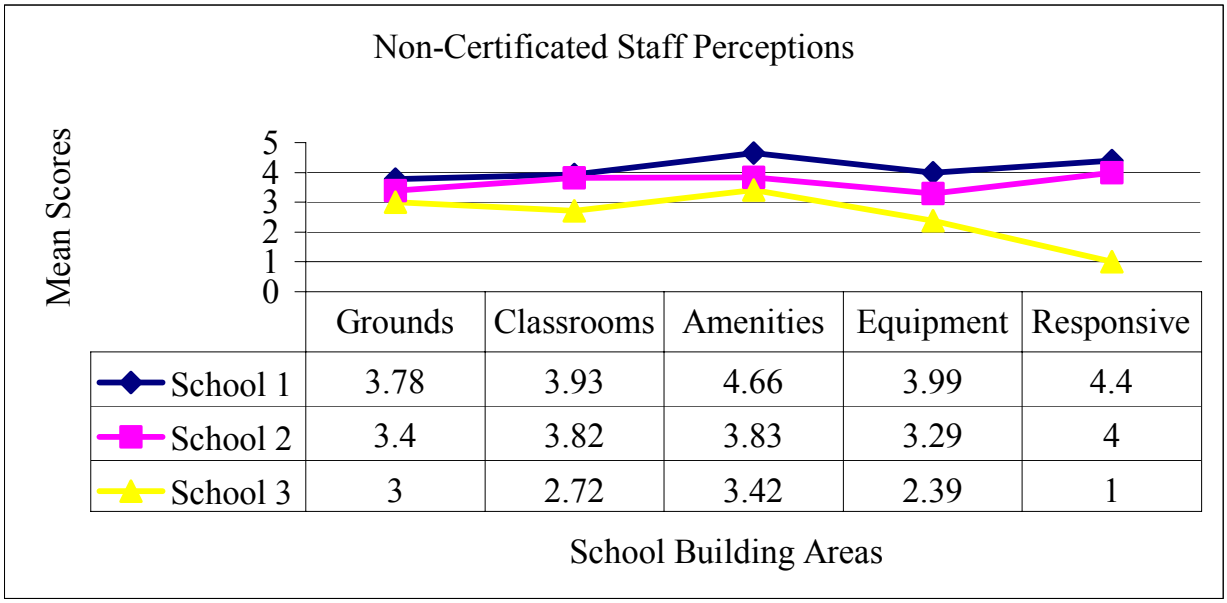
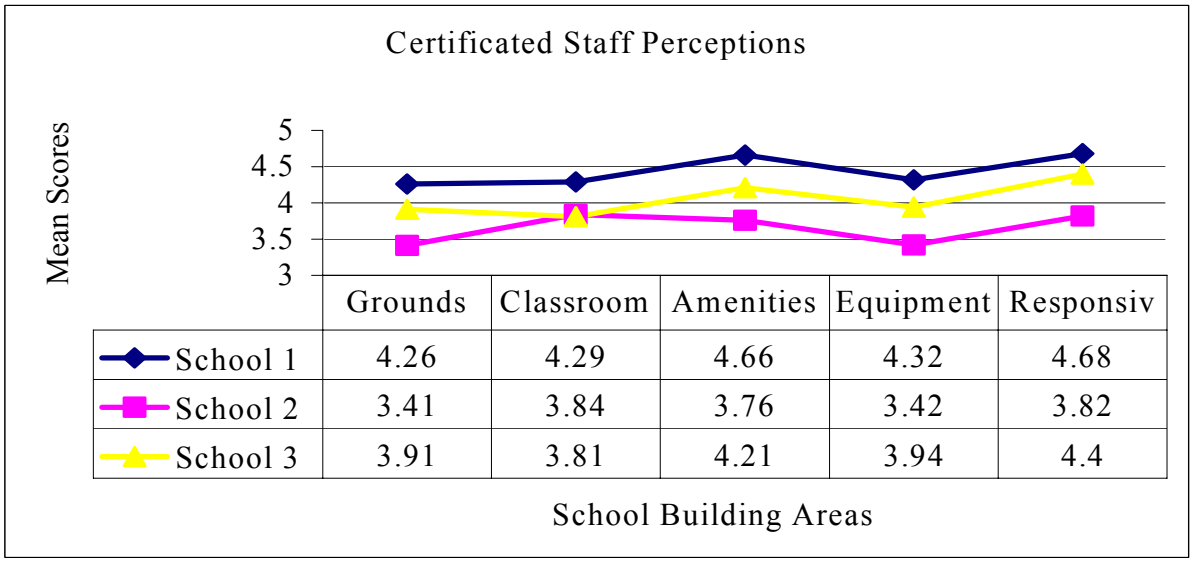



Figure 3.



Results in figure 2 indicate the certificated staff in each of the three schools found the building to be more responsive and were more satisfied with the equipment, classrooms, and grounds than the non-certificated staff, who found the shared amenities, which included the cafeteria, kitchen, restrooms, and offices slightly more satisfying.

Overall, staff at School One was more satisfied with all aspects of the building project. Responses by participants at School Two reveal they were the least satisfied with aspects of their building.

Participation in the Planning Process by Scale by School

Although building administrators in School Two and School Three stated that almost all current occupants had the opportunity to participate in the planning process for their specific building projects (Interview with Building Two Administrator on November 9, 1999; Interview with Building Three Administrator on November 5, 1999), only seven respondents from School Two and eight respondents from School Three stated they had been provided the opportunity to participate. This may offer one explanation why the overall mean scores of certificated staffs' perception of facility responsiveness were lowest in these two schools (See Figures 3 & 4). Overall, for all schools reporting, 73 staff members stated they did not participate in planning, whereas, 15 stated they did participate in planning.

Utilizing the ANOVA procedure, the effect of participation of staff members in the planning process was significant $F(1, 83) = 8.89$, $p = .004$. The means and standard deviations for participation ($M = 3.86$, $SD = .74$) and non-participation ($M = 4.14$, $SD = .62$) were reported for informational purposes. The ANOVA source table for participation in the planning process was included in Table 4.

TABLE 4

ANOVA Source Table for Participation in the Planning Process by Scale by School

| Source | df | MS | F | Sig |
|---|---|---|---|---|
| Between Groups | | | | |

| | | | | |
|---|---|---|---|---|
| School | 2 | 24.73 | 11.25 | .000* |
| PP | 1 | 19.56 | 8.89 | .004* |
| School by PP | 1 | .804 | .366 | .547 |
| Error | 83 | 2.20 | | |
| Within Groups | | | | |
| Scale | 4 | 2.63 | 14.20 | .000* |
| Scale by School | 8 | .335 | 1.81 | .074 |
| Scale by PP | 4 | .397 | 2.15 | .075 |
| Scale by Sch by PP | 4 | .180 | .975 | .421 |
| Error | 332 | .185 | | |

Note: *$p = .05$

Overall, the staff members who participated in the planning process were more satisfied with the new facilities, classrooms, and equipment than the staff members who did not participate in the process. The most significant difference was noted in the level of responsiveness of the facility to student and staff needs. Participation in the planning process attributed to a higher level of satisfaction with the newly constructed facility.

Original Staff Member by Scale by School

The mean for the number of years of experience with each of the three districts was calculated in order to gain insight into the average length of employment with each staff. School One possessed the most experienced staff (M = 11.07) with School Two (M = 6.88) having the least experienced staff, and School Three (M = 10.12). School One reported the highest number of original staff members with 24/29; School Two had 23/33; School Three had 14/26. School One also reported a higher level of satisfaction with the new facility in general. Utilizing the ANOVA procedure, the effect of being an original staff member was not significant F (1, 87) = .086, p = .770.

## Conclusions

All interviewees felt their respective facilities were responsive to staff and student

needs and that the buildings enhanced the academic achievement of students. However, most key stakeholders interviewed expressed concern over their inability to quantitatively support these beliefs.

All three facility planners were already employed by the school districts in the following positions: School One-Coordinator of New Construction, Facility Improvement, and Maintenance; Schools Two and Three-directors of elementary education who were assigned the duty of opening a new facility in addition to other duties. School One was the only district to use a facility task force, and this was created shortly after the selection of the architect (Interview with FTFC, November 17, 1999). The architects were all selected after the facility planners were assigned to the project.

All architects, in conjunction with the facility planners and building administrators, conducted a one-year walk-through for warranty inspection. However, limited formalized evaluation was conducted by the school districts, although all key stakeholders expressed a desire for this information and felt that it would be helpful for future planning.

It can be concluded there was a difference in perceptions of teachers and ancillary staff members as to the level of responsiveness of their facilities based on the Univariate ANOVA. The main effect of school was significant $p = .001$. There were differences in perceptions by the staff members between the three schools based on the ANOVA within groups by scale, which was statistically significant $p = .000$. There were differences in perceptions by the certificated and non-certificated staff members at the three school sites based on the ANOVA of school by scale statistical significance $p = .000$.

The findings of this study illustrate the importance of involvement of future occupants in the designing, planning, and construction of a new educational facility in order for the occupants to view the structure as responsive. Inclusion of certificated, as well as non-certificated, staff members who will occupy the newly constructed facility will create a structure that is more closely aligned with their needs.

## Implications for Practice

The findings of this study clearly present the need and importance of including future stakeholders in the creation of a responsive facility. To augment future study, several implications may be concluded from this research: 1. early involvement of future occupants in facility design and planning is critical if the structure is to be viewed as responsive to

student and staff needs; 2. staff and support staff personnel play an important role in the overall success of a school facility and must be included; 3. some level of satisfaction with the newly created structure appears to be based on incorporation of the staff into the process of ordering supplies and materials; 4. particular attention needs to be focused on the allocation of sufficient funds to complete the project with adequate landscaping, playground equipment, and parking; 5. inclusion of schools located in more urban settings would be helpful in order to analyze the timing and the selection of future occupants in the designing and planning process of educational structures; 6. development of a sequential method for the completion of facility planning, with a variable built in for school district size, would be beneficial for future designing; 7. a more thorough analysis of evaluation techniques currently used by architects and facility planners would create a deeper understanding for future facility planning; 8. further testing and development of a facility evaluation questionnaire, which allows staff members to have input into an evaluation component is important; 9. continuation of a new trend in research on facilities and student achievement is warranted.

## Recommendations for Future Research

Current studies concerning the enhancement of environmental factors relating to the increase in academic achievement of students could contain important information for future facility planning (Moore & Lackney, 1994). Future research related to the process of inclusion of key stakeholders to gain a more in-depth understanding of the facility designing and planning procedures needs to occur.

Future use of the questionnaire developed by this researcher may require modifications, dependent upon the scope of the information desired. For example, the evaluator may not need information relating to the number of years the staff member has been in the district as it was not significant to this study. Additional information relating to facility planning is critical as new structures are designed and old structures are renovated to meet the needs of today's students.

The development of written guidelines or procedures for a systematic way to include future occupants could be a tremendous support for key stakeholders as impending facility planning occurs. The guidelines would need to be cognizant of the size of the school district and the process should be fairly sequential in nature.

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