

# Cleanliness



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# & Learning in Higher Education

In 1992 APPA published a seminal work titled *Custodial Staffing Guidelines for Educational Facilities*. The work was based on a concept that was in the embryonic stage in 1986 and then grew in momentum through 1988 when the APPA Board of Directors commissioned a task force to address custodial staffing issues at institutions of higher education. The *Guidelines* became so popular that it was revised in 1998. The two editions addressed a critical need in facilities management at educational

institutions. Even though institutions were growing in size and in delivery of services, custodial staffing budgets were either staying static, or in many cases, decreasing. In other words, each custodian was being asked to clean more square feet than ever before. The facilities managers did not have an empirical document to fall back on that indicated how many custodians were really needed to complete the tasks at hand and the impact of such on productivity or cleanliness.

By Jeffrey L. Campbell, Ph.D.,  
and Alan S. Bigger, M.A.

The *Guidelines* became that document and defined five levels of cleanliness and clearly stated that as the square feet of area assigned to a custodian increased, there was a direct impact on the level of cleanliness. The second edition of the *Guidelines* clearly identifies this phenomenon. According to the book's staffing service levels chart, a custodian can clean 87,000 square feet of carpet office space at level 5. However, you get what you pay for at level 5, where the level of cleanliness defined as "Unkempt neglect – floors and carpets are dull and dirty, dingy, scuffed, and/or marred. There is conspicuous buildup of old dirt...." The research for the *Guidelines* shows the impact of decreasing custodial staffing: Less staff results in dirtier spaces.

The findings of the *Guidelines* are based upon the feedback of hundreds of individuals and institutions. In addition, the expertise of professional organizations such as ISSA, the worldwide cleaning industry association, was integrated into the publication. The *Guidelines* have been in use for over two decades by an ever-increasing number of institutions to validate staffing requirements and to justify the need for custodial budgets.

Even though the *Guidelines* addressed staffing levels and the impact of staffing levels on cleanliness, *it did not address the impact of cleanliness on the students that were involved in higher education.* If there was an impact of staffing levels on cleanliness, could the

case be made that there was an impact of the levels of cleanliness on an individual student's ability to learn? Representatives from ISSA and APPA started to ponder these issues a few years ago.

### BACKGROUND INFORMATION

In 2005, representatives from APPA and ISSA met to discuss conducting collaborative projects that would enhance the facilities management profession. After considerable discussion, the two associations decided to concentrate on cleanliness in higher education institutions and the impact that cleanliness has on student performance. The representatives concluded that a study should be conducted that would seek to determine if there was any correlation between the five levels of cleanliness and student performance. Such documentation would provide unique insights for facilities services providers.

The representatives from APPA and ISSA met several times to clarify the direction of the research project. They concluded that the project should be coordinated through APPA's Center for Facilities Research (CFaR). Bigger applied for approval through CFaR for the research project to be conducted by Jeff Campbell of Brigham Young University (BYU), the students of BYU's Facilities Management Program, and Bigger. CFaR accepted the project and APPA, in concurrence with ISSA,

agreed to fund and support the project that would seek to:

- Determine if there is a correlation between the five levels of cleanliness and student learning.
- Determine if there is a link between personal health and cleanliness.

### LITERATURE REVIEW

There were nine empirical research studies identified that sought to discover whether there was a relationship between the condition of school buildings and student academic achievement. Each study was conducted in a K-12 school environment, and in all cases the academic achievement of students was measured by scores on standardized tests. Most of the studies were motivated to determine how the governing body should allocate funds to maintain and refurbish its schools. (Though other studies were identified, all referenced back to one or several of these nine seminal studies.) No studies were identified that conducted research for institutions of higher education, nor did the literature review identify stud-

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ies that specifically measured a relationship between the cleanliness of the study environment and student academic achievement. These studies strongly support a positive correlation between school building conditions and student achievement (Berner, 1993; Berry, 2002; Cash, 1993; Earthman, 1995; Hines, 1996; Stevenson, 2001). Other variables such as building age, student attendance, and teacher retention were considered by various researchers (McGuffey, 1982; Stevenson et al, 2001; Buckley, 2005). However, the levels of cleanliness and the impact on a student's ability to learn or performance were not addressed. [Ed. Note: The full research report with all cited references is available at [www.appa.org](http://www.appa.org).]

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**custodian** was being asked  
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**feet** than ever before.

#### METHODOLOGY

APPA has membership from approximately 1,200 institutions of higher education. There are about 4,500 institutions of higher education in the United States. An alphabetical database of APPA's institutional members and representatives was initially used by the researchers with every 60th institution selected to participate in the study. The goal was to have 20 institutions participate in the 20-question survey. When an institution did not respond or otherwise declined to participate, researchers went to the next institution on the list. Each institution was asked to obtain clearance for the research from their respective institutional research board (IRB). Each institution was asked to either provide a list of e-mails of a random sample of students or to send the survey to a random sample of students at their institution. SurveyMonkey, an online survey instrument, was used to distribute and collect the surveys.

Bigger and Campbell met with BYU students and later with Dianna Bisswurm (ISSA) in early April 2007 to clarify the direction of the project. When Campbell and Bigger met to direct the project, it was determined that the ideal methodology to measure student academic achievement would be to collect grade point averages from students (with the assistance of school registrars) based upon a random selection of students at participating institutions. However, we determined that issues of privacy would preclude this approach and that it would be too cumbersome and time consuming. Thus it was decided to randomly select institutions, and then send surveys to their student body utilizing lists of e-mail addresses provided by the institution. In most cases,

the institutions became the deliverer of the survey document, because participants preferred this approach.

The second challenge that emerged was finding the right source of contact at each institution to be the "lead" for the survey. Initially it was felt that the institutional representative of APPA at each participating institution should be the contact person (as discussed later); however, reality dictated that the primary contact for such a process should be the institution's research board or equivalent. Once this was determined, the process of disseminating the survey became much easier. A considerable amount of time and effort was expended on trying to contact the right people and offices to receive approval and distribution of the survey.

Receiving approval for the implementation of the project at all randomly selected institutions also presented significant challenges. Not only was it difficult to find the right contact, it was also problematic to receive approval from some institutional research offices, due in part to the fact that many institutions were receiving too many surveys or that the timing of this particular research did not fit with the calendar of research at the institution.

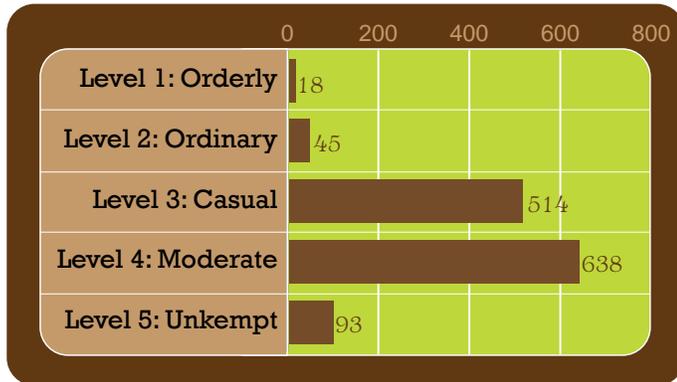
The research methodology began as planned. All APPA institutional representatives were contacted by e-mail and telephoned several times over the period of three months. Most declined to participate because it was either too hard to get IRB approval or because too many surveys were already planned for fall 2007. We discovered that having the APPA institutional representative seek IRB approval was not the best method because they do not perform research on a regular basis. It would have been more effective to go directly to each institution's research board.

Given that the desired response was not obtainable, it was determined that the best alternative was to accept those institutions that had agreed to participate and select others that would represent varying geographical areas of the U.S., and different sizes of public and private institutions. In addition, even though the researchers did not receive approval to survey 20 schools as originally planned, the fact that the student base of higher education institutions comes from scattered areas of the U.S. and many foreign countries led us to surmise a broad sampling of student perspectives and attitudes would still be possible. Dr. Dennis Eggett, director for the Center for Statistical Consultation and Collaborative Research at BYU, determined that a sample size of 1,000 would provide a qualified sample.

#### RESPONSES TO SOME SURVEY QUESTIONS

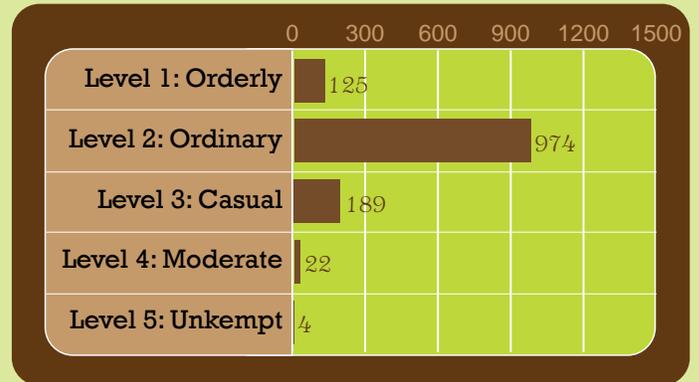
More than 1,400 surveys were received from students attending institutions from the West, Midwest, East, and South United States. Three of the institutions were public and two private. The institutions ranged in size from 1,185 to more than 34,000 students. Students provided 892 comments on how cleanliness affects their health, and 681 comments on how to improve campus cleanliness. The survey instrument, numerical responses, and written responses are included in the complete study. Some key questions and results include:

**Q11.** At what level do you feel that the cleanliness of *campus buildings* would begin to be a distraction to your ability to learn?



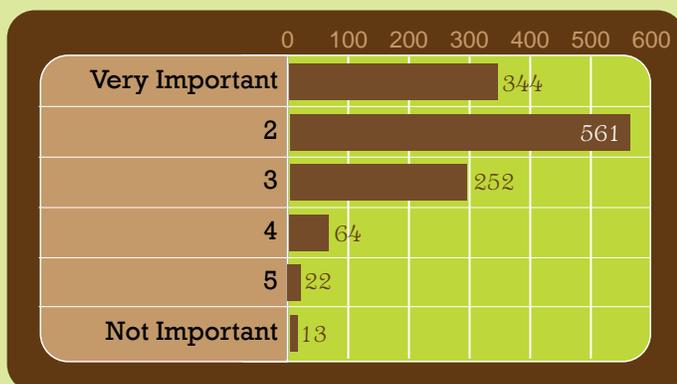
Level 1 – Orderly Spotlessness 1.4%  
 Level 2 – Ordinary Tidiness 3.4%  
 Level 3 – Casual Inattention 39.3%  
 Level 4 – Moderate Dinginess 48.8%  
 Level 5 – Unkempt Neglect 7.1%  
 N=1308

**Q12.** What level of cleanliness of campus buildings do you consider sufficient to create a good learning environment?



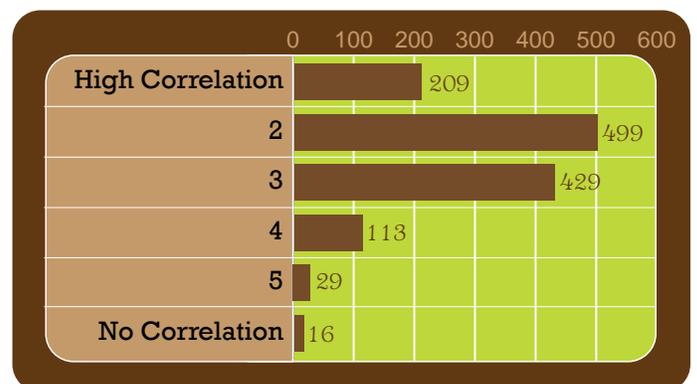
Level 1 – Orderly Spotlessness 9.5%  
 Level 2 – Ordinary Tidiness 74.1%  
 Level 3 – Casual Inattention 14.4%  
 Level 4 – Moderate Dinginess 1.7%  
 Level 5 – Unkempt Neglect .3%  
 N=1314

**Q15.** How important is cleanliness to your learning environment? (1 = Very important, 6 = Not important)



1 Very Important 26.5%  
 2 43.3%  
 3 22.5%  
 4 4.9%  
 5 1.7%  
 6 Not Important 1.0%  
 N=1296

**Q16.** What level of correlation do you think exists between building cleanliness and student's ability to learn? (1 = High Correlation; 6 = No correlation)



1 High Correlation 16.1%  
 2 38.5%  
 3 33.1%  
 4 8.7%  
 5 2.2%  
 6 No Correlation 1.2%  
 N=1295

**Q13.** Rank the following *building elements* in order of the perceived impact to your personal learning (1 = Highest Impact, 8 = Lowest Impact). Each number can only be used once.

	Highest Impact	2	3	4	5	6	7	Lowest Impact	Mean	Response Count
Noise Level	51.8% (664)	18.6% (239)	11.2% (144)	5.9% (75)	4.9% (63)	2.9% (37)	2.7% (35)	2.0% (25)	2.23	1282
Air Temperature	18.1% (231)	31.0% (396)	19.0% (243)	12.4% (158)	7.0% (90)	6.1% (78)	4.2% (54)	2.3% (29)	3.06	1279
Condition of Facility	4.8% (61)	7.9% (100)	11.9% (151)	19.2% (243)	21.2% (268)	19.4% (246)	10.0% (127)	5.5% (70)	4.70	1266
Cleanliness	3.5% (44)	7.9% (100)	18.2% (231)	22.2% (281)	21.2% (269)	16.3% (206)	8.5% (108)	2.1% (27)	4.43	1266
Cosmetic Appearance	1.1% (14)	1.2% (15)	1.9% (24)	5.1% (65)	10.4% (132)	14.5% (184)	27.4% (348)	38.5% (489)	6.58	1271
Furniture Arrangement	1.1% (14)	2.3% (29)	4.1% (52)	7.0% (90)	9.6% (123)	12.6% (162)	28.2% (361)	35.1% (450)	6.48	1281
Available Space	8.7% (112)	12.0% (155)	14.1% (181)	15.8% (203)	13.2% (170)	18.5% (238)	11.9% (153)	5.8% (75)	4.45	1287
Lighting	11.5% (149)	19.4% (252)	20.5% (266)	13.6% (176)	13.3% (172)	9.9% (128)	6.4% (83)	5.5% (72)	3.81	1298

N=1310

Statistical Mean Ranking:

- #1 – Noise Level (2.23)
- #2 – Air Temperature (3.06)
- #3 – Lighting (3.81)
- #4 – Cleanliness (4.43)
- #5 – Available Space (4.45)
- #6 – Condition of Facility (4.70)
- #7 – Furniture Arrangement (6.48)
- #8 – Cosmetic Appearance (6.68)

Ranking	
Q1	2.23 Noise level
Q2	3.06 Air temperature 3.81 Lighting 4.33 Cleanliness 4.45 Available space 4.70 Condition of facility
Q3	6.48 Furniture arrangement 6.68 Cosmetic appearance
Q4	

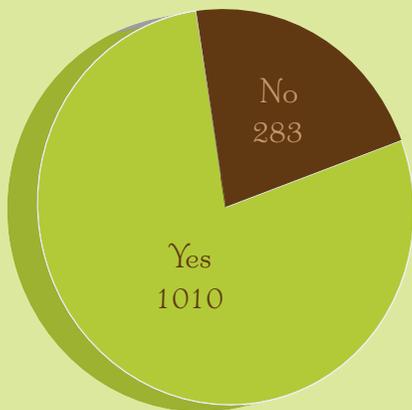
**Q17.** At what level do you think students should be involved in keeping campus buildings clean? (1 = Very Involved; 6 = Not involved at all)



1 Very Involved	16.2%
2	34.1%
3	29.6%
4	13.5%
5	4.6%
6 Not Involved at All	2.0%

N=1296

**Q18.** Do you believe that the cleanliness of campus facilities has an impact on your health?



Yes 78.1%  
No 21.9%  
N=1293

## COMMENTS AND RECOMMENDATIONS

Based upon the literature review and analysis of the 20 questions (not all listed in this summary report) several recommendations and conclusions can be offered.

The literature review shows ample evidence that there is a positive correlation between school building conditions and academic achievement. Unfortunately, building conditions are viewed holistically and not divided into specific elements. Measuring building condition is a subjective practice and can have alternative motives for gaining capital funding. Building age is also a strong indicator of building condition.

Poor building conditions, including inadequate custodial service have shown a correlation to low student attendance. Student attendance is a significant variable in predicting academic scores on standardized tests.

Building conditions also have an impact on teacher attendance and retention. Quality teachers are important to sustaining high student scores. Building conditions ranked higher in one study than teacher salaries.

**Recommendation #1: Building conditions including custodial service should be considered an important factor in student academic achievement.**

Q.14 asked the students to identify the learning space

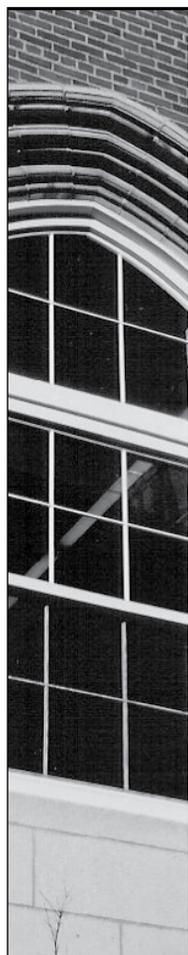
where they thought they learned best. The overwhelming response was classroom space followed by library space and personal living space.

**Recommendation #2: Given that classrooms were ranked #1 as students' most effective space to learn, classrooms should receive proper cleaning attention at level 2 (ordinary tidiness).**

Over a third of the respondents said that the lack of cleanliness became a distraction at a level 3 (casual inattention). Almost half of the respondents said that the lack of cleanliness became a distraction at a level 4 (moderate dinginess); 74.1 percent of the respondents indicated that their desired level of cleanliness is a level 2 (ordinary tidiness).

**Recommendation #3: Be concerned about learning space cleanliness that drop to levels 3 (casual inattention) and level 4 (moderate dinginess).**

Eighty percent of the students said that they should be very to moderately involved in keeping campus buildings clean. Only 20 percent of the students



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reported negatively about being involved in campus cleaning.

**Recommendation #4: Higher education institutions should promote programs that include students in keeping campus facilities clean.**

More than 78 percent of students responded that they believe that the cleanliness of campus facilities has an impact on their health. Eight hundred ninety-two students described how cleanliness affects their health; 681 students provided suggestions as to how campus facilities cleanliness could be improved.

**Recommendation #5: Listen to students' feedback and suggestions and initiate actions to address their concerns and suggestions.**

This national study surveyed college students ( $N=1481$ ) to determine if there is a correlation between the **Five Levels of APPA Cleanliness** and academic achievement. The findings showed that 88 percent of students reported that the lack of cleanliness becomes a distraction at APPA Level 3 (casual inattention) and Level 4 (moderate dinginess). Eighty-four percent reported that they desire APPA Level 1 (orderly spotlessness) and a Level 2 (ordinary tidiness) of cleanliness to create a good learning environment. Cleanliness ranked as the fourth most important building element to impact their personal learning. Students perceive that there is a relationship between levels of cleanliness and their ability to learn, and

students do link cleanliness with improved learning achievement. Seventy-eight percent reported that cleanliness has an impact on their health. Students provided 892 comments of how cleanliness affects their health and 681 comments on how to improve campus cleanliness. Students reported that lack of cleanliness affects allergies, spreads germs, increases bug and rodent infestations, and promotes higher stress levels.

**Recommendation # 6: Institutions of higher education need to develop levels of cleanliness that create an environment that contributes to student learning.**

Based upon the analysis of the survey data it is concluded that there is a correlation between the **Five Levels of APPA Cleanliness** and their perceived impact on student learning. It is also concluded that students do link personal health with cleanliness.

#### CONCLUSION

The APPA, ISSA, and BYU research team learned a tremendous amount from this process. The 1,573 written comments not only provided a framework for the researchers, but also provided unique information that could be used by each participating institution. APPA's seminal work on custodial staffing and levels of cleanliness is enriched by the findings and recommendations of the research team and participants.

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Institutions of higher **education** need to **develop** levels of **cleanliness** that create an environment that contributes to **student learning**.

The research could be expanded, in the future, to include such issues as maintenance staffing and grounds staffing and the subsequent impact of these areas upon students.

Facilities managers are now well armed with two distinctive approaches to staffing custodian operations at their institutions. The first approach is based on the *Custodial Staffing Guidelines* (1992, 1998) that assist managers to staff their cleaning operations based upon APPA's five levels of service, with clearly defined outcomes of staffing at each level. An organization cannot staff their operation at APPA Level 5 and expect APPA Level 1 results. The findings of this research study indicate that the levels of cleanliness do impact the ability of students to learn. There is a correlation, maybe stated in simple terms, that the cleaner the learning space the greater the probability that students perceive they will learn. What a powerful duo of

tools. Facilities managers can now clearly indicate that decreased staffing leads to decreased levels of cleanliness, and that there is a direct connection between the cleanliness of a facility and students' ability to learn. If educational institutions are to provide the best environment in which students can learn, they would be well advised to staff at a level that will provide an acceptable level of cleanliness that will contribute to student learning and health and not detract and distract from that critical goal. ☺

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