

Lean, Mean, Green Cleaning Machine: One School District's Quest for Sustainability

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ABSTRACT

There are more than 2 million janitors and building cleaners employed in the US; due to the nature of their jobs, building cleaners work with substances that are potentially hazardous and health-threatening. The emerging wealth of knowledge about the health risks associated with conventional cleaning products among scientists, administrators, educators, and consumers have prompted many institutions to change their practices. Some schools are switching from traditional cleaning products to eco-friendly alternatives. Despite the evidence of schools adopting green cleaning practices, green cleaning programs continue to face obstacles that affect their sustainability. My study identifies the obstacles that affect the implementation and sustainability of school-based green cleaning programs by conducting a case study with the Alameda Unified School District. Through a review of the literature and interviews with the program coordinator for the California Department of Public Health's Occupational Health – Asthma Prevention branch, the Alameda Unified School District maintenance, operations & facilities program coordinator, and the janitorial staff at three pilot sites I identify the obstacles on a variety of scales. Consistently, the largest obstacle to implementing and sustaining a school's green cleaning programs is resistance from the janitorial staff. Increased cooperation and communication among janitors, green cleaning program coordinators, and external organizations (e.g. public health and/or environmental) can help a school's green cleaning program flourish.

KEYWORDS

eco products, public health, asthma, obstacles, program implementation

INTRODUCTION

There are more than 2 millions janitors and building cleaners employed in the US (BLS 2010); due to the nature of their jobs, building cleaners work with cleaning substances that are potentially hazardous and health-threatening. According to the EPA, approximately 31,000 tons of soap and cleaning compounds were generated as hazardous waste in the US (EPA 2005); 32 tons of contaminants are released in the air each day in California (Nazaroff and Weschler 2004). Cleaning products contain chemicals that can present various risks to human and environmental health; for example, occupational asthma is associated with harsh cleaning chemicals and is one of the major work-related illnesses contracted by cleaning workers (Acosta-Leon 2006, EPA 2010, Bello et al. 2009, Birnbaum and Jung 2011, Gute et al. 2009, Makela et al. 2011, Medina-Ramon et al. 2003, Okumura 2009, Vizcaya 2011, Yu et al. 2011). There are between 137,000 and 315,000 adults in California with work-related asthma (Flattery et al. 2006). There are many cleaning chemical compounds that can act as asthmagens, or substances that can cause or exacerbate symptoms of asthma (HSE 1997). Chemical cleaners release air pollutants that are also asthmagens; for example, chemicals in pine and citrus oils react with ozone in the air to produce formaldehyde, which is an asthmagen (Singer et al. 2006).

As a result of the increased knowledge about negative health effects concerning cleaning chemicals, there has been a push by environmental, labor, public health organizations, and consumer groups to introduce green products into the supply chain of the cleaning market (DeSimone 2002, Iles 2006) and a response by consumers to purchase and use green products (Eriksson 2004). “Green” products can mean both environmentally-sustainable cleaning equipment and less-toxic chemical cleaners (EPA 2010). Sustainable cleaning equipment includes products that promote water conservation, energy efficiency, indoor environment quality, and waste reduction (Balek 2009). These appliances have less negative effect on the environment (EPA 2010). Green chemical cleaners have less negative effect on human health when compared with products or services that serve the same purpose (EASHW 2009, EPA 2010). For example, the Environmental Working Group tested various conventional and green cleaning products used in schools and found that the traditional cleaners emitted five times more pollutants than the green substitutes (EWG 2009). Though green chemical cleaners may not be

completely non-toxic, these alternatives do not exacerbate health problems (EWG 2009, Bello et al. 2009, Pechter et al. 2009).

The emerging wealth of knowledge about the health risks associated with conventional cleaning products among scientists, administrators, educators, and consumers prompted many institutions, including some public schools, to change their practices (CLASS 2009, RAMP 2010). Schools are institutions with populations that may be exposed to asthma and thus have become the targets of environmental and public health organizations for cleaning program transformations. In 2009, the California Department of Public Health (CDPH) developed within its Occupational Health Branch a project that offers school districts a chance to form their own green cleaning programs. In collaboration with Green Schools Initiative, the CDPH's Work-Related Asthma Prevention Program created CLASS (Cleaning for Asthma Safe Schools). Together, they formed a green cleaning toolkit that provides schools with guidelines to develop green cleaning programs. It is an opt-in, voluntary program that provides extra training, guidelines, and grants for schools that are interested in creating their own green cleaning program. Fairfield-Suisun, Elk Grove, and Fresno Unified School Districts are among a few of the districts currently in partnership with CLASS (RAMP 2010, Shrem 2012). These school districts have invested in new, greener cleaning materials and equipment in attempt to reduce the incidence of asthma and improve sustainability of their schools (RAMP 2010, Ojigho 2012).

Despite the evidence of schools adopting green cleaning practices, the implementation of green programs continues to face obstacles that affect the sustainability of such programs. Though there is much toxicological research supporting the implementation of such programs (Acosta-Leon 2006, EPA 2010, Bello et al. 2009, Birnbaum and Jung 2011, EWG 2009, Gute et al. 2009, Makela et al. 2011, Medina-Ramon et al. 2003, Okumura 2009, Vizcaya 2011, Yu et al. 2011), there are few studies that evaluate and explore the obstacles that impact the abilities of green cleaning programs in schools to initiate and sustain themselves (CFESS 2008, CMS 2011). My study explores the obstacles to implementation and sustainability in order to understand how to facilitate the implementation of a green cleaning program in a school district. My study aims to illuminate the obstacles that impact the implementation and sustainability of a school's green cleaning program.

Case study site

In California, there are almost 1 million full-time and part-time employees in elementary and secondary education, including teachers, building cleaners, and administrators (US Census Bureau 2010), with more than 6 million students enrolled in public schools; 216,000 are enrolled in Alameda County alone (DOF 2011). I chose to do a case study of the Alameda Unified School District (AUSD) because it was one of the first districts to work with Cleaning for Asthma Schools (CLASS). It had tested green cleaning guidelines before CLASS had officially launched (Shrem 2012) and because the program coordinator of CLASS had not yet followed up with the progress of its green cleaning program.

The maintenance, operations & facilities (MOF) program coordinator at AUSD collaborated with and received a grant from CLASS to build a district-wide green cleaning program in 2010. The green cleaning program is currently in its early stages; AUSD is pilot testing the program on several schools within the district. If the pilot program is a success, the program coordinator would implement the green cleaning program across schools district-wide (Ojinho 2012). The pilot program consists of reducing dozens of cleaning chemicals down to a few Green Seal-Certified alternatives: all-purpose cleaner, disinfectant, neutral cleaner, and graffiti wipes; transitioning from disposable cotton mops and rags to nylon microfiber ones and laundering system via mobile washing machines; removing the use of bleach from non-food servicing areas; switching out buckets and mops for automated restroom cleaning machines; and increasing staff training for the new equipment. Schools (i.e. head custodians of school) that were interested volunteered for the pilot program; these schools are the first in the district to test the new equipment. Two elementary schools and one middle school are currently participating in the pilot program. These schools are using Marauder, a peroxide all-purpose general cleaner. They are also testing disinfecting products and environmentally-friendly graffiti wipes before a final recommendation.

METHODS

Literature Review

In order to find out existing obstacles in school-based green cleaning programs, I reviewed primary and secondary literature. I explored case studies that include interviews with school administrators regarding obstacles to implementation of such programs. I also reviewed the product information of the kinds of green products schools might use, such as material safety data sheets for chemical cleaners and instruction manuals for the restroom cleaning machine because challenges may lie in the product choice and usage. Reviewing product specifics is useful because it can uncover potential sources of obstacles to implementing and continuing a green cleaning program.

Interviews

I conducted interviews with the program coordinator of Cleaning for Asthma Safe Schools (CLASS), the maintenance, operations & facilities (MOF) program coordinator for Alameda Unified School District, and the janitorial staff at the three study sites in order to uncover the obstacles that affect the implementation and sustainability of school-based green cleaning programs. I interviewed at different institutional levels (i.e. guideline-making, decision-making, and use) to gain different perspectives in the obstacles that can affect a school's green cleaning program. In order to gain information on the CLASS-participating schools and obstacles to green cleaning in those particular schools, I conducted an interview with the program coordinator for CLASS. To obtain specific knowledge of the Alameda Unified School District's (AUSD) green cleaning program, I interviewed AUSD the maintenance, operations & facilities (MOF) coordinator. In order to further understand the obstacles reported by the MOF coordinator, I interviewed the head custodians at the three study sites.

Obstacles as reported by CLASS program coordinator

In my interview with the coordinator from CDPH, we discussed the green cleaning program guidelines and pertinent issues surrounding green cleaning programs in schools. This semi-structured interview was a starting point for my study. I asked her questions about CLASS, such as “why was this program created?” and “which schools are currently operating under

CLASS guidelines?” because I assumed that knowing more about this asthma-prevention collaboration could give me an in-depth understanding of the importance of green cleaning programs in schools. After realizing all the benefits of green cleaning, we discussed the reasons why some schools choose not to adopt green cleaning practices (i.e. obstacles that prevent the implementation and/or continuation of a green cleaning program); it is important to know why some schools choose not to develop green cleaning program despite the benefits. I asked her questions about third-party certifications (or eco-labels) because greenwashing, a term that describes deceptive use of green marketing that promotes a misleading perception that a product is environmentally-friendly, may be an obstacle to successfully developing a green program.

Obstacles as reported by AUSD MOF program coordinator

Next, I interviewed the MOF district coordinator at AUSD because she is in charge of procurement, development and implementation of the green cleaning program at the school district. I asked her for information on the cleaning industry and the types of products they use on the pilot campuses because I wanted to know more about the kinds of green cleaning products they use. I asked questions such as, “what changes have you made in the cleaning program for the pilot campuses?” because I wanted to know what types of green cleaning practices AUSD adopted (did they switch to green products, or did they only reduce the number toxic chemicals while continuing to use them, etc). I also asked her what obstacles she has faced since starting the pilot program under the assumption that acknowledging the challenges in my study can potentially lead to solving these problems. Addressing these issues can help clarify and improve guidelines.

Obstacles as reported by AUSD janitorial staff

Lastly, I spoke with some of the custodial staff at the three study sites because they are the ones who actually work with the cleaning products. With prior knowledge from the district coordinator interview, I asked the head custodians questions such as, “which products are the staff currently using?” (I wanted to check if the products the MOF director mentioned were actually being used and enforced), “which disinfectants is this school currently testing?” because

they have not decided on the exact disinfectant they will use, and “has the staff been reluctant to use some of these products? Why?” under the assumption that the staff may have faced some problems with the new equipment.

RESULTS

Literature Review

I compared the obstacles and sources of challenges of different school districts that have developed green cleaning programs. Amity Regional School District reports their obstacles to be expensive and ineffective green alternatives, and overall custodial resistance (ARSD 2007). Fairfield School District reported ineffective green products as well (FSD 2007). Simsbury Public School District and Old Lyme Middle School were concerned with the lack of product quality and variety (SPS 2007, OLMS 2007). Simsbury Public School District and Ridgefield Public School District reported custodial resistance as an obstacle (SPS 2007, RPS 2007), while Montville Public School District reported none at all (MPS 2007).

Interviews

Table 1. Summary of obstacles as reported by interviewees.

Interviews	Economic-bureaucratic	Preference-perception	Other
CLASS program coordinator	Expensive green alternatives (not always the case); lack of funding; lack of staff to dedicate to green cleaning program	Negative perceptions of green cleaning products; custodial frustration with products	Greenwashing; health issues; burden associated with creating new program
AUSD MOF program coordinator	Limited budget for new equipment	Janitorial suspicion; perceived inferiority of green products; preference for traditional products	Learning curve associated with new equipment
AUSD janitors	More communication between ranks requested	Negative perception of green products	Training issues with new equipment; health issues

Obstacles as reported by CLASS program coordinator

The program coordinator of CLASS stated that the primary obstacles a California school might face would be funding issues, resistance from the janitorial staff, and greenwashing,

though there may be other challenges (Table 1). One obstacle we discussed was custodial resistance to the green cleaning program. The CLASS coordinator found that some janitors dislike the use of green chemical cleaners because of their negative perceptions and experiences with green cleaners. Finally, the issue of greenwashing can be a problem, not just for the continuation of a green cleaning program, but for health, as well.

Obstacles as reported by AUSD MOF program coordinator

The main obstacle the AUSD green cleaning program face is janitorial resistance. The maintenance, operations and facilities program coordinator at AUSD has received many complaints from her custodial staff about the new products they have to use. They dislike the new restroom cleaning machines because they are less intuitive than traditional cleaning methods. The staff also dislikes the fact that they are restricted in their ability to use bleach. The AUSD program coordinator also reports janitorial misperception of “eco-friendly” as 100% safe to be a concern and potential obstacle to the continuation of the green cleaning program.

Obstacles as reported by AUSD janitorial staff

Resistance seems to come from janitors who are hesitant to use new equipment, especially the automated cleaning machines. At the pilot sites, the janitors are testing green disinfectants; they have narrowed down to a few, but have not yet decided on one. They have a difficult time choosing a green disinfectant because some of them do not work as well as their traditional counterparts. Bleach is normally the disinfectant they would use (Ojigbo 2012), but the program coordinator set restrictions on the amount and areas they can use bleach as an attempt to curb improper usage (OSHA 2005).

DISCUSSION

Literature Review

I compared different case studies that presented obstacles and different sources of challenges. *Higher prices* of green products (ARSD 2007) were once an issue. Green products were sometimes *ineffective* when compared to conventional ones (ARSD 2007, FSD 2007, SPS 2007). *Lack of product variety* (OLMS 2007) and *custodial resistance* (ARSD 2007, RPS 2007, SPS 2007) were also obstacles, while others claimed to face none at all (MPS 2007). These were the types of obstacles that I found in the literature. Because these school districts are located in a state other than California, so the results may lack total generalizability to the challenges facing California school districts. The schools did not report political-bureaucratic obstacles, such as resistance from school administrators or issues with funding.

Interviews

Obstacles as reported by CLASS program coordinator

The program coordinator of CLASS stated that the main obstacles a California school might face would be funding issues, resistance from the janitorial staff, and greenwashing. Due to the fiscal crisis of the state, public schools usually face deep cuts during times of economic turmoil. California public schools face budget cuts of \$1 billion (York and Watanabe 2011). Janitorial services are often among first programs these cuts (NY Times 2011, HSC 2012). According to the CLASS coordinator, many schools are facing this problem. Several school district officials she has spoken with do not want to start a green cleaning program because of budget cuts. New products have large upfront costs, so it is very difficult for an economically-struggling school district to foot the bill for new green equipment, despite knowing the benefits associated with green cleaning (Shrem 2012).

Another obstacle we discussed was janitorial resistance to the green cleaning program. The CLASS coordinator found that some janitors dislike the use of green chemical cleaners because they have a negative perception of the green alternatives. Some products require more physical exertion when cleaning, so janitors become frustrated with the products. Because of green cleaning products are less ergonomic than conventional products, they put more physical pressure on the janitors. These are the types of obstacles that impact the sustainability of a

school's green cleaning program. If the people who use the products (i.e. janitors) do not like them, it will be very difficult for the program to continue.

Finally, the issue of greenwashing can be a problem, not just for the continuation of a green cleaning program, but for health, as well. Greenwashing occurs when a product boasts environmental-friendliness, when in fact it is not. More specifically, greenwashed cleaners can still contain harmful chemicals, despite their green claims (EWG 2009). "Green marks" or "eco-labels" (i.e. Green Seal), are useful when deciding which green cleaning products to purchase and use. These types of green marks are useful in combating against deceptive marketing claims (Zimmerman 2005). Green Seal is a third-party certification for environmentally-friendly products used in non-residential facilities, such as chemical cleaners and paper products (Green Seal 2010). Many school districts, including AUSD, rely on the Green Seal certification to decide on their cleaning products, which may be helpful in the procurement process.

However, there are some issues with consumer or institutional reliance on "green marks". Large green cleaning corporations can out-compete smaller green businesses products because of their ability to pay to get certification testing (minimum \$9100, maximum \$14000 depending on annual sales revenue tiers) (Green Seal 2010). Although these labels are helpful, facilities managers need to look beyond these certifications and look at the products in depth because there may be other effective products on the market that did not receive certification due to economies-of-scale.

Obstacles as reported by AUSD MOF program coordinator

The main obstacle the AUSD green cleaning program face is janitorial resistance. The maintenance, operations and facilities program coordinator at AUSD has received many complaints from her custodial staff about the new products they have to use. They dislike the new restroom cleaning machines because learning how to operate them is too difficult. The staff also dislikes the fact that they are restricted in their ability to use bleach. Other schools have reported custodial resistance to green cleaning, as well (ARSD 2007, RPS 2007, SPS 2007). However, though initial resistance to the idea of green cleaning is common among janitors, usually after engaging and involving the staff in product choice and program planning, this resistance becomes cooperation (Sawchuk 2009).

The AUSD program coordinator also reports janitorial misperception of “eco-friendly” 100% safe to be a concern because it can be harmful to health. Although environmentally-friendly products can potentially be all-natural, “green” products may still contain harsh chemicals, though to a lesser extent or in different concentrations than traditional cleaning products (EWG 2009). For example, Marauder General All-Purpose cleaner, the cleaner that AUSD uses, is considered “eco-friendly” but it contains hydrogen peroxide, which is a skin irritant. Janitors who do not wear gloves when using this product may experience burns or rashes (NIOSH 1992). The program coordinator states that some of her janitors choose not wear gloves when using the products so they experience skin irritation under the impression that the green cleaner will not irritate because it is eco-friendly (Ojigho 2012). Janitors misjudging “eco-friendly” for harmless is an obstacle that can impact the continuation of a school’s green cleaning program because it can cause janitors to criticize the products (Shrem 2012).

Obstacles as reported by AUSD janitorial staff

Some janitors at AUSD expressed an anti-green sentiment, while others very much enjoy using the green products. Overall, resistance seems to come from janitors who are hesitant to use new equipment, especially the automated cleaning machines, due to their perceived difficulty or inefficacy. Janitors want green cleaning products that are equal or exceed the cleaning ability of conventional cleaning products. For the janitors, the green alternatives, no matter what type (e.g. cleaning machine, microfiber rags, all-purpose cleaners, etc), have to work as well as, or better than, the conventional versions, otherwise, they will not enjoy working with the new products. My findings differ from the results in the literature; many janitors like the switch to green chemical cleaners because of health benefits and appreciate the new cleaning machine because they are ergonomic (RAMP 2010). The learning curve associated with using green equipment may help explain this discrepancy; some products, especially the restroom facilities cleaning machine, are not as intuitive as traditional cleaning methods, but become simple to use with practice (KaiVac 2005, Ojigho 2012). It is important that janitors are onboard with the green cleaning products because they are a vital part of the sustainability of a green cleaning program.

Study limitations

My study is relatively non-generalizable; it is restricted to the Alameda Unified School District. Implementation of the green cleaning programs in this district was voluntary. Other districts may enforce its programs at each school on an involuntary basis. The AUSD had these particular priorities – water conservation, waste reduction, and worker health concerns; other school districts may have other goals. Another limitation may be the lack of samples in my study. I had only interviewed six people for this project. More samples may have increased the overall knowledge of this study.

Broader implications

When developing and continuing a district-wide green cleaning program, it seems that the janitorial resistance was a consistent obstacle among school districts, as reported by the CLASS program coordinator, case studies, and the AUSD program coordinator. The custodial staff is crucial to the success of a school's green cleaning program because the employees are the ones who actually work with the products on a daily basis; without their cooperation, it will be difficult for the green cleaning program to move forward (Sawchuk 2009, Ashkin 2011). The school MOF program coordinator is essential for the creation and implementation of a green cleaning program. This program coordinator has to engage the janitorial staff in creating the best program possible. Once the janitorial staff accepts these new products into their cleaning repertoire, the green cleaning program will meet less resistance. Schools can combat training issues by inviting vendors to demonstrate the proper usage of the new equipment. There is a learning curve associated with these new products, so more training and education on their benefits can help smooth the transition from conventional to green (Ojigho 2012, RPS 2007). Facing these obstacles together will help facilitate the creation and implementation of green cleaning programs, which can improve indoor air quality, lead to a decrease in work-related illnesses, and encourage sustainability in our schools. It is crucial for the California Department of Public Health and other environmental organizations to work closely with school districts and to be aware of their potential challenges. By exploring the obstacles that impact the implementation and continuation of a schools' green cleaning programs, schools can properly

address current and potential barriers to their programs' sustainability and move forward. Directors of green cleaning programs can combat this issue by working closely and increasing communication with the head custodians of each school and the janitorial staff to reduce tension (RPS 2007).

Future research

Potential future research ideas are plentiful due of the dearth of studies on greening schools. The following are ideas for further research: analysis of products used in schools (e.g. testing and comparing different conventional products and their alternatives, investigating the ingredients of green cleaners), indoor air quality assessment, analysis of rate of asthma level decrease among staff and/or students before and after the implementation of green cleaning programs, and perceptions of green cleaning efficacy among janitorial staff/students/community. These can be performed at one individual school, as a case study, or as comparisons between schools or districts.

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APPENDIX

Interview with CLASS program coordinator

- What's your role in CLASS?
 - When did was CLASS developed?
- Which schools have you worked with?
 - Did schools initiate contact or vice versa?
- Policy
 - Who develops the guidelines to enact a green program?
- Of the schools that don't have one, why the resistance?
 - Reasons?
- Green cleaning programs
 - Funding that would have once gone into purchasing traditional cleaning supplies would now go into buying green products
 - Are green cleaning products more expensive than traditional ones?
- What are the risks associated with a green cleaning program?
- What other issues do you want to address? Is there a really important subject that I should know about?

Interview with AUSD MOF program director

- Institutional hierarchy and how it affects the different steps of program implementation
 - **Funding:** how are funds allocated within the district/within each school?
 - **Decision-making:** who decides to start a green cleaning program within the district/school? How are decisions made?
 - **Procurement decisions:** decentralized (per school) vs. district
 - **Implementation:** who implements the green cleaning program? District-wide or school-wide?
 - **Assessment/evaluation:** who performs assessment of the program?
 - **Continuation:** who decides that the program should continue? How this decision is made (i.e. what factors are looked for?)
- Where can I obtain a copy/more information about policies regarding the implementation of the AUSD green cleaning program?

Specifics

- Please tell me a little bit about your involvement with CLASS
 - Green cleaning program for entire district or just specific schools
 - Do guidelines differ for specific type of school (elem/middle/high)?
- Why did this district decide to start a green cleaning program?
- How was the green cleaning program developed (following guidelines of CLASS?)
- What were the main challenges you faced when preparing for this program?
 - Was there any resistance?
- How is the program implemented?
 - New training for staff?
 - Volume green products used per district, per school, where exactly are the products used in schools (e.g. restrooms/kitchens/hallways)
- How does the district decide their vendors? How does the school combat greenwashing?

- Is packaging/marketing strategy important in deciding which brand/type to buy?
- What cleaning products are the schools using now?
 - Are they Green Seal/Eco Logo certified?
 - Were these the supplies that has been used since the start of the program or have they been recently switched?
- Have you noticed any changes since the switch to green cleaning products, for example: fewer custodians calling in sick, fewer injuries and falls, any complaints about the products?

Interview with AUSD janitorial staff

- What are some of the major challenges that your staff experience?
 - Why resistance?
- Which disinfectant are you currently testing?
- Are the new products as/more effective than the older ones?
- New training?
- Ways of improving green cleaning program?