

Maintenance practices in public lavatories in tertiary institutions in Ghana

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Abstract:

This research aimed to investigate public lavatories' maintenance practices in Ghana's tertiary institutions. This study gathered data from both primary and secondary sources. The probability sampling technique was used since it was the most valid choice for producing results, while 180 participants were sampled from the entire population using a sample size calculator. The study was limited to the Accra Technical University campus as a case study, and the staff and students were the target population. The key factors were the appropriate way of maintaining public lavatories. To not compromise its reputation, every tertiary institution must have a working lavatory for its staff, students, and visitors. The study revealed that the public lavatories at the university campus are not in good condition. Several sanitary appliances in the lavatories are unsafe, indicating ineffective maintenance practices. According to the survey's findings, the problem of damaged toilet flush handles and unflushed excreta was widespread. The issue of the strong odour was one of the significant findings of this work. This work facilitates the maintenance officers and management in Ghana's tertiary institutions and guides designers when specifying sanitary appliances for public lavatories. It is critical to improve lavatory upkeep to ensure students, the entire working staff, and visitors' welfare on health and safety, comfort and happiness.

Keywords:

Maintenance, public lavatory, tertiary institutions, Ghana

1 Introduction

Buildings and other constructed assets require regular maintenance to keep them pleasant and performing at their best. Aside from the building's disintegration and degeneration, poor care can diminish performance, affect health, and endanger the safety of tenants and those nearby (Designing Buildings, 2020). According to the Royal Institution of Chartered Surveyors (2009), building maintenance has been seen as the "Cinderella" of service delivery for many years, with little attention paid to innovation and "free-thinking." However, it should be noted that building maintenance is not the sole factor in ensuring the built environment's long-term viability; its economic worth in terms of employment and expenditure is equally significant. University campuses have public lavatories used by residents and non-resident members of the university community and visitors who spend the day on campus. Hundreds of people use these lavatories daily, making them ideal for infection transmission (Arhin *et al.*, 2020). According to Alderson (2018), a poll conducted by cascades tissue organisation found that 65 respondents claimed that lavatories influenced their view of the school they

attend, and 60% said they would advise students to always check the lavatories of schools before enrolling. To ensure that the entire working staff, students, and visitors are satisfied, public institutions must prioritise their facilities for the highest possible health and safety, welfare, comfort, and happiness. According to the Royal Institution of Chartered Surveyors (RICS), maintenance is defined by BS 3811:1993 as the sum of all technical and administrative measures used to keep or restore an asset to a state where it can fulfil its intended purpose. This means two processes must be considered: work done in expectation of failure and restoration and work done after failure. The former is preventive maintenance, whereas the latter is known as corrective maintenance. Any maintenance strategy should primarily focus on preventative rather than corrective maintenance. Today's public lavatories are far more sanitary than a few years ago. This is due to several factors, not just one. The methods and practices used to install such work are far more advanced than in the past; the manufacturer has greatly improved the construction and quality of the fixtures (One Point Partition, 2018).

2 Literature Review

The best sort of upkeep for a public lavatory is preventive maintenance. It allows for a more proactive approach to maintenance and prevents minor faults from becoming larger problems down the road. Cleaning, inspections, adjustments, lubrication, and component replacement are all examples of preventive maintenance, as is any other analysis that extends the life of a facility (Designing Buildings, 2020). According to a report published by Swaohha Andra Corporation in 2016 design and management of a facility are inextricably linked since the innovative design of components ensures ease of management and lower operation and maintenance costs. Alderson (2019) also emphasised that innovation in public lavatory design improves cleanliness, aesthetics, and operational efficiency and encourages user happiness and school loyalty and pride. According to Shaw *et al.* (2019), it is important to identify and involve stakeholders in the design process. Involving stakeholders will aid in developing relationships, raising awareness of obstacles and hurdles, fostering ownership, and ensuring that facilities are built to fulfil people's needs, expectations, and wishes. Arhin *et al.* (2020) admit that every tertiary institution must have a working lavatory for its staff, students and visitors. Alderson (2018) posits that educational institutions' lavatory state can impact their reputation. Alderson (2018) supported a poll conducted by cascades tissue organisation that found that 65 per cent of respondents claimed that lavatories influenced their view of the school they attend, and 60 per cent said they would advise students to always check the lavatories of schools before enrolling.

To ensure that staff, students, and visitors are satisfied, public institutions must prioritise their facilities. Design and material selections must meet the structure's life requirement (Scranton Product, 2016). Aside from meeting the obvious need for a lavatory, design decisions should be made to allow easy cleaning and management, strong vandalism resistance, and low maintenance requirements. Scranton Product (2016) opines that stakeholders must be identified and included in the design process of public lavatories. Their involvement would aid in developing relationships, raising awareness of obstacles and hurdles, fostering ownership, and ensuring that facilities are built to fulfil people's needs, expectations, and wishes. This adaptation will also reduce

the need for adjustments and help avoid future problems. There are two key categories to consider: users and duty bearers (Shaw *et al.*, 2019).

An institution's corporate image might be harmed by overcrowding, and a long line in the lavatory and gender is vital to consider when considering higher institutional lavatories (One Point Partition, 2018). The number of expected users may affect the final design of a public lavatory. Therefore, it is crucial to know how many lavatories to build and how many WCs or urinals to include (Scranton Product, 2016). Women are discouraged from using public lavatories due to poor location, improper design, and maintenance. Furthermore, they encounter several problems and risks when using public lavatories (Greed, 2006). Because women's sanitation needs differ greatly from men's, it is necessary to consider gender when planning and designing public lavatories and devise institutional arrangements for their operation and upkeep. Whitney (2020) posits that staff and students of the higher institution can be put off by the smell of public lavatories, damaging their experience and reducing their opinion of the facility; therefore, the control of lavatory odour is of utmost importance. There appears to be an increasing need for more urinal privacy. This is especially crucial for males with shy bladder syndrome and other medical or psychological issues (Greed, 2006).

According to the City of Greater Geelong's public lavatory design guideline (2012), urinals should be waterless or automated to prevent uric acid build-up. Only non-step urinal troughs should be installed where a urinal trough is deemed necessary to facilitate easy washing out of the lavatory. The manual-flush toilet necessitates manual control to trigger the flush (Aung *et al.*, 2015). According to Douillard (2019), many studies have proven that squatting is the best way to empty toilet bowls. However, squatting is not free from risk since the study has shown that it induces a small rise in blood pressure in healthy and hypertensive patients; some stroke has been found to occur during squatting (Ho, 2016). Hand-washing is the single most effective method of preventing infectious diseases, according to Anderson *et al.* (2011), because the hands are the primary mode of transmission of many diseases. Touchless warm and jet air dryers with higher-tech components are technological fixtures (Aung *et al.*, 2015). According to the City of Greater Geelong's public lavatory design guideline (2012), wash hand basins should be stainless steel to improve hygienic conditions. According to the City of Vancouver (2018), a public lavatory should have no dark or unlit regions in higher institutional lavatory rooms (2018). Infectious disease has influenced the concept of bathroom design. Yuko (2020) opines that Improving health and hygiene in tertiary institutions' public lavatories is important. Storto (2021) postulates that fixtures, faucets, soap dispensers, hand dryers, and toilets should all be hands-free to avoid cross-contamination. Enviropitt (2019) admits that placing hand hygiene dispensers in strategic locations; making soap dispensers readily available and fully stocked is critical for ensuring good public lavatory hygiene.

3 Methodology

Amaratunga and Baldry (2002) indicate that mixed-method research has a fundamental and necessary requirement to achieve sound empirical results in built environment research. The mixed-method comprising quantitative and qualitative methods of acquiring data was used for this research. A quantitative approach was used through

field survey questionnaire distribution on the Google form platform to students and staff of Accra Technical University. The qualitative data was obtained through critical action research, including physical observation, which paved the way to gain in-depth knowledge about the state of the lavatories on the Accra campus of Accra Technical University through narrative analysis. The quantitative and qualitative enquiries took approximately 90 days to gather the relevant information. Morse *et al.* (2008) argue that it is necessary to achieve rigour in physical observation in action research to obtain information, a quality without which qualitative research would face acceptability challenges in academia and the industry. From both quantitative and qualitative aspects of the study, the authors proposed trustworthiness, suitability, and confirmability to ensure credibility. In this research, a letter of consent was written first-hand to the institution's directorate of research, innovation publication, and technology transfer (DRIPTT). An ethics application form was filled to assure stakeholders involved, which was the specific strategy to attain trustworthiness. Acquiring qualitative and quantitative data for this work ensured a better understanding of the problem and better recommendations. According to Accra Technical University Strategic Plan 2021, the University have a population of 17,500. A sample size of 180 participants was used using a sample size calculator that forms a 13.7% population proportion with a 95% confidence level and 7.12% margin of error. The probability sampling technique was used for this research since it is the most valid choice for producing results representing the whole population (Bhandari, 2021; Elliott, 2020; McCombes, 2021). Random sampling, which gives every member of the population an equal chance of being selected, was applied in this research.

4 Findings and Discussion

A sample size of 180 was used, and 113 responses being 63% of the sample size, were obtained. 83% of the respondents were students, while 17% were staff (Figure 1). 34% were females, while 66% were male. 96% of the respondents have used the lavatories on Accra Technical University Campus, while 4% never used the lavatories (Figure 2).

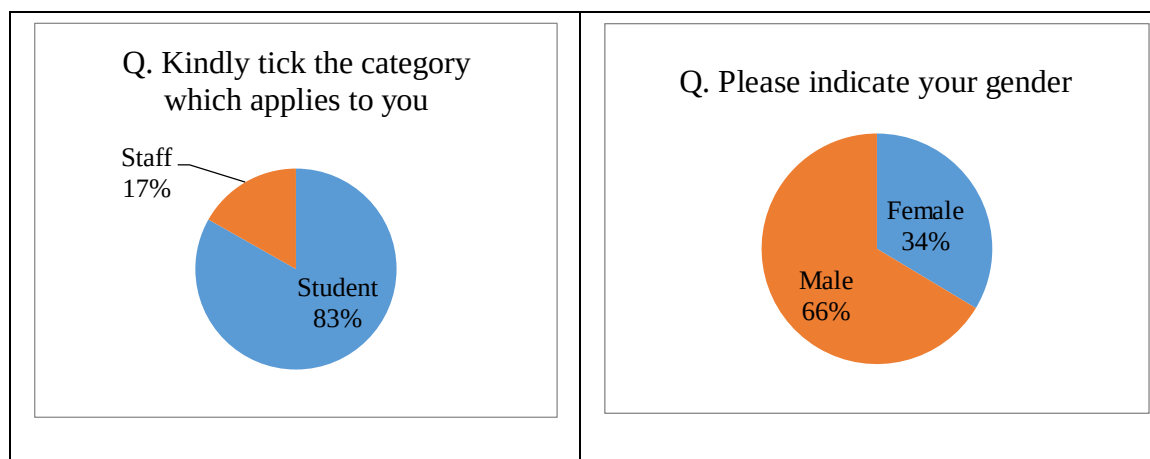


Figure 1: Category of participants (Source: Field Survey)

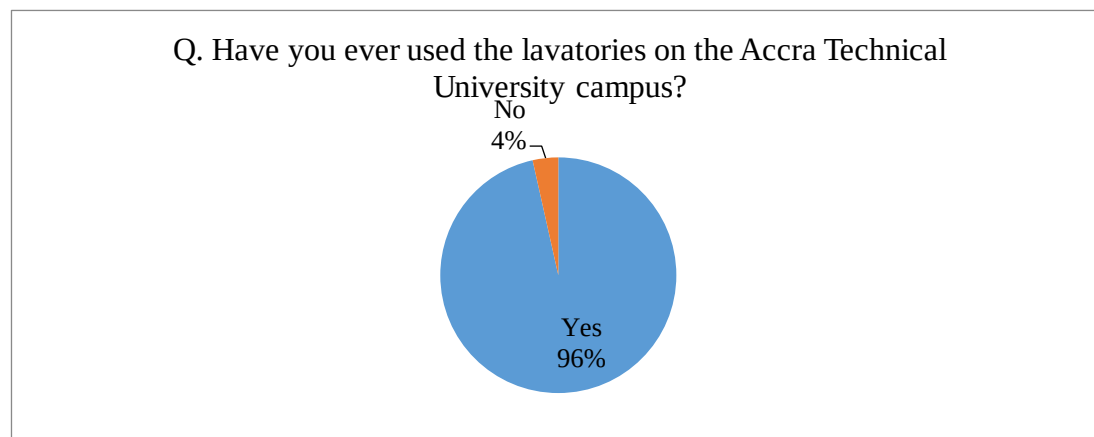


Figure 2: Participants who have used the lavatories on the ATU campus
(Source: Field survey)

4.1 Condition of lavatory

Q. What was the condition of the lavatory when you last visited?

It was learnt from the literature review that preventive maintenance is the best type of maintenance for public lavatory since it allows for a more proactive approach to maintenance and prevents minor faults from escalating. According to Alderson (2018), the state of a lavatory provides consumers with a positive or negative impression of the establishment; therefore, it can influence the reputation of educational institutions. Based on the information in table 1, 45% of the respondents said the lavatories were in poor condition when they last visited, and 35% said it was very poor. In comparison, 15% said the condition was ok, and 5% said it was ok said it was in good condition.

Table 1: Condition of the lavatory when respondent last visited

Variable	Frequency	Percentage (%)	Cumulative percentage (%)
Very good	0	0.0	0
Good	5	4.5	4.5
Ok	17	15.0	19.5
Poor	51	45.1	64.6
Very poor	40	35.4	100.0
TOTAL	113	100.0	100.0

(Source: Field Survey)

78% of the respondents said there are instances where they failed to use the lavatory due to unsanitary conditions, and 22% said they have never experienced that situation, according to the data in table 2). These results suggested that the lavatories at the Accra Technical University campus in Accra are not in good condition. These results were confirmed during physical observation; refer to plate 1 of the photograph below.

Table 2: Respondent's failure to use lavatory due to unsanitary condition

Variable	Frequency	Percentage (%)	Cumulative percentage (%)
Yes	88	77.9	78.0
No	25	22.1	100.0
TOTAL	113	100.0	100.0

(Source: Field Survey)

4.2 Problems users usually encounter in public lavatory

According to the results in Table 3, 71% of the respondents said they often encounter broken WC flush handles which sometimes prevents them from using the WC or leaving it un-flushed. It was found out during physical observation that most of the flush handles are either broken or not functioning, which is why 81% of the respondent said they often encounter un-flushed excreta anytime they visit the lavatory (refer to Table 3). 96% of the respondent said the odour in the lavatories is strong. The circumstances attest to Whitney (2020), which states that unpleasant odours in lavatories impair users' experiences and reduce their impressions of a facility. Therefore, unpleasant odours in public lavatories can be a big barrier to the entire working staff and students.

Table 3: Problems users' encounter

Problem	% of Respondents
Broken WC flush handle	71.00
Un-flushed excreta (toilet)	81.00
Strong odour	96.00

(Source: Field Survey)

4.3 Flushing system for public lavatory

According to Figure 3, 71% majority usually failed to flush the urinal after use, while 29% of the user flushed the urinal after use. Some users who failed to flush the urinal afterwards stated a lack of water that did not flow. Further investigation was carried out during physical observation. It was found out that the valve connected to the urinal is inappropriate as it leaves the urinal un-flushed since most users will avoid touching it. Figures 4 and 5 confirm that an automatic flushing device would be a good choice for public lavatory since 73% of the respondents prefer automatic valves. In comparison, 27% prefer manual ones for urinals, 71% prefer automatic flush valves, and 29% prefer manual ones for flushing WC.

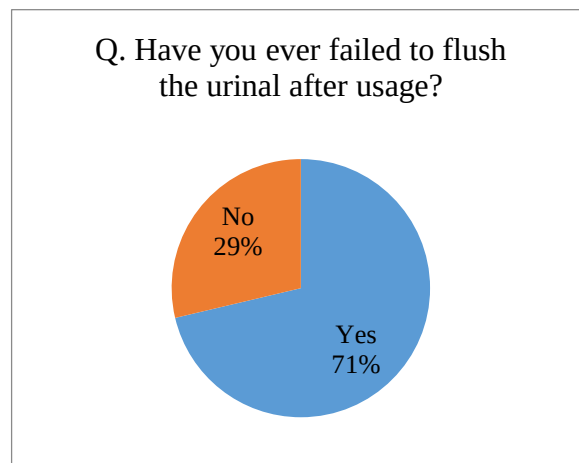


Figure 3: Failure to flush urinal (Source: Field survey)

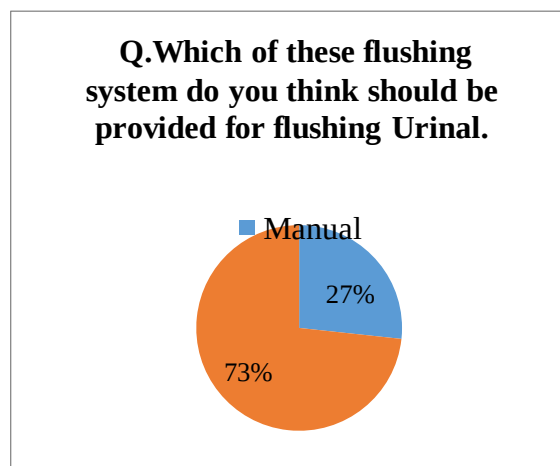


Figure 4: Flushing system for urinal (Source: Field survey)

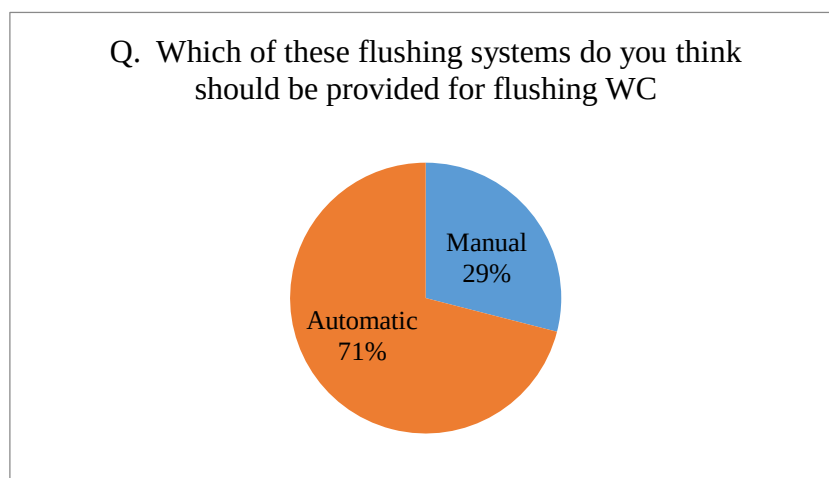


Figure 5: Flushing system for WC (Source: Field survey)

4.4 Cleanliness of lavatory

According to Figure 6, 17% of the respondents said the lavatories are very dirty, 57% said they are dirty, 24% said they are ok, and just 2% said they are clean. This result shows that the cleaning of the lavatories is not adequate.

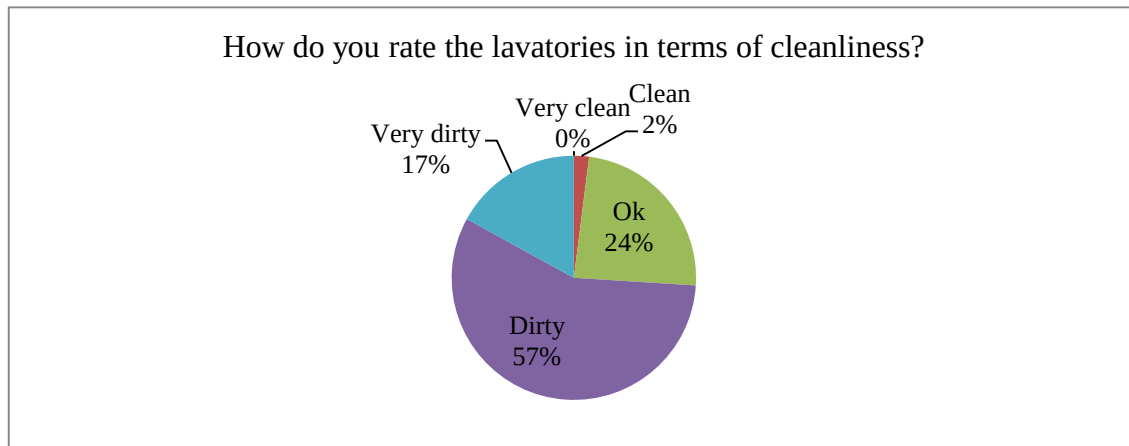


Figure 6: Cleanliness of public lavatory (Source: Field survey)

Physical observation results also present visual evidence of the poor condition (Figure 7). People will return to a facility if it is kept clean. Women, who are more susceptible to urinary tract infections when using a WC that is not kept clean, would prefer to defecate in the open than use one that isn't (SAC, 2016).



Figure 7: Pictures showing a lavatory in a poor condition, WC cistern with broken flush handle and a stop valve to a urinal (Source: Physical observation)

5 Conclusion

This research aimed to investigate public lavatories' maintenance practices in Ghana's tertiary institutions, and the study gathered data from primary and secondary sources. The study established that lavatory fittings and fixtures are the significant components of a public lavatory. Much attention should be given to them during the design stage to help improve user health and safety, comfort and hygiene. The study also established that the condition of a lavatory affects users. This work proved that an automatic sanitary device is appropriate for public lavatory since it minimises physical handling, which is the cause of most wear and tear and the spread of diseases. A well-designed public lavatory should be easy to maintain, clean, dry, well-lit and ventilated. Public lavatories should be designed to minimise hand contact as far as possible to reduce damage due to misuse and to promote hygiene.

6 Practical Implications and Recommendations

Every tertiary institution must have a working lavatory for its staff, students and visitors in order not to compromise its reputation. Once the lavatory cleaning, inspections, adjustments, and component replacement are left unattended, the facility's life begins to fail. The study recommends that the institution's authorities would do something urgently to improve the lavatory's upkeep to ensure students, the entire working staff, and visitors' welfare on health and safety, comfort and happiness. Further studies are recommended to cover a broader scope of the tertiary institution in the country on public lavatories.

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