N.K.T. NATIONAL COLLEGE OF EDUCATION FOR WOMEN

(Autonomous)

No. 41, Dr. Besant Road,

Triplicane, Chennai-600 005

Report on the Maintenance & Optimum Use of Campus Facilities through Quality Circles

TRANSFORMING STUDENTS TO GLOBAL EDUCATORS

Submitted to the Internal Quality Assurance Cell in its Meeting held on

25th June 2021

Milestone Chart

Stage	Month / Activity	1	2	3	4	5	6	7	8	9	10	11	12
1	Defining the Challenge												
2	Analyzing the Challenge												
3	Identifying the Causes												
4	Finding out the Root Causes												
5	Action Taken												
6	Implementation												

Report on the Quality Circles Project

Project No. NKTNCE/QCP/01

Project Title: Maintenance & Optimum Use of Campus Facilities through Quality Circles

Date of Initiation: 15th March 2020

Date of Completion: 14th March 2021

QC Team Name: NKT Environmental Sustainability Team

Quality Circle Positions	Members
Advisory Committee	Dr. M. Arumugam, College Secretary
	Dr. S. Chamundeswari, Principal
	Dr. S. Malathi, IQAC Coordinator
Faculty Team Leader	Dr. T. Sahaya Saila
Faculty Team Members	Mrs. V.R. Santha Kumari
	Mrs. T. Keziah
	Mrs. V. Geethanjali
Student Team Leader	A. Divya, Physical Sciences
Student Team Members	N. Valarmathi, Tamil
	A. Alagugeetha, Mathematics
	C.V. Nandhiuni Bharathi, English-Special Education
	R. Rajalakshmi, Mathematics
	N. Hemalatha, Biological Sciences
	L. Vijimathi, Mathematics
	K. Vasumathi, Physical Sciences
	A. Jesileena, Tamil
	L. Annie Suci Queen, Mathematics
	A. Abitha, Mathematics
Admin Team Leader	Mr. M. Rajkumar, Office Assistant
Admin Team Members	Mr. E. Dhinakaran, Plumber
	Mr. S. Mahesh, Electrician
	Mr. R. Paneerselvam, Watchman
	Mr. B. Prabhakar, Office Assistant
	Ms. G.R. Malliga, Sweeper

1. Introduction

N.K.T. National College of Education for Women established in the year 1966 is situated at the heart of the Chennai city. Our College is housed in an area of 3.06 acres, where a model school is also attached. The College offers graduate, post graduate and research courses in Education with Autonomous status granted by the University Grants Commission in the year 1988, and has adequate facilities for teaching and learning with wi-fi enabled classrooms, well equipped laboratories, updated technological facilities and well maintained campus with required basic amenities. The College ensures fair allocation and resourceful utilization of facility based on the critical needs of educational, research and administrative activities to establish standard procedures for the use of physical, academic and support facilities.

Effective Campus maintenance protects capital investment, ensures the health and safety of students and employees, and supports educational performance. The challenge of maintaining campus facilities to meet the needs of 21st century learners keeps increasing in all educational institutions. The task of caring for old buildings, some of which are historically or architecturally significant, to support contemporary instructional practices is substantial and at the same time, maintaining the new, more technologically advanced facilities also demands considerable expertise and commitment. Thus, it is not surprising that campus maintenance has emerged to be a great concern in all educational institutions.

2. Need for Implementation of Quality Circles

Challenges to maintain arise in both new and old facilities, although the types of concerns may differ. Older buildings, on the other hand, more frequently face age-related issues such as inefficient energy systems that can lead to uncomfortable indoor climate and high utility bills. Extreme environmental conditions leading to natural disasters and a lack of maintenance funding contribute to building deterioration. But many maintenance problems related to maintenance staffing levels, training, and management practices.

Routine and unexpected maintenance demands are bound to arise and the Institution proactively develops and implements a plan for dealing with these inevitabilities, as the consequences affect teaching and learning, student and staff health, day-to-day building operations, and the long-range fiscal outlook of the Institution.

As a sound maintenance plan serves as evidence that campus facilities are, and will be, cared for appropriately, and on the other hand, negligent facilities maintenance planning can cause real problems, the College ventured the maintenance and utilization of physical, academic and support facilities sustainable through formation of Quality Circles involving Students, Faculty members, Non-Teaching Admin Staff, Technical Support Staff and the Advisory Committee including the Management.

3. Implementation & Progress of Quality Circles

The College campus basic facility maintenance is concerned about more than just resource management. It is about providing clean and safe environment for students. It is also about creating a physical setting that is appropriate and adequate for teaching and learning.

Campus maintenance affects the physical, educational, and financial foundation of the College organization, and should, therefore, be a focus of both its day-to-day operations and long-range management priorities. In this regard, Quality Circles are formed for better maintenance and utilization of physical, academic and support facilities. The following are the stages involved.

Stage-1: Defining the Challenge

The challenge of meeting standards with regard to maintenance by providing regular monitoring, cleaning, sanitation, and repairs to prolong the life of buildings and reduce the need for replacing equipment at the College is defined and found to be challenging.

Stage-2: Analyzing the Challenge

Managing and maintaining campus facility is a challenging task. Taking care of physical, academic and support facilities in the Institution is an essential part of day-to-day operations. But, when performed well, the utilization of physical, academic and support facilities can enhance teaching environment, improve the culture of the College, and support student overall performance outcome.

Maintaining buildings and equipment meeting health and safety regulations requires careful planning. Buildings may vary in age and construction type, which means carrying out, regular surveys and inspections evaluations, and inspections. Planned preventive maintenance can extend the use of campus buildings and equipment. Managing electrical maintenance such as lighting, water, plumbing requires strong processes and monitoring.

Buildings have a considerable impact on the environment. The Environmental Sustainability Monitoring Committee shoulders the responsibility of providing a safe working environment, undertaking risk assessments, monitoring the need for repairs, and improving air conditioning as well as being responsible for water treatment and waste disposal; Regular maintenance of playgrounds, and sports equipment and tending to trees, grass, and any exterior storage.

Regular risk assessments help to keep pupils and teaching staff safe. This means monitoring fire doors, extinguishers, blankets, and hose reels.

Maintenance planning and scheduling helps users to monitor the condition of equipment and plan for maintenance before they become unusable. Keeping equipment fit-for-purpose reduces the chances of needing emergency repairs. Proper facilities management also aids in automating the purchasing process from approved suppliers.

Stage-3: Brainstorming to Identifying the Causes for the Challenge

Taking action without identifying the causes to the challenge can result in misdirected efforts, and that wastes time and resources. Brainstorming session is held with Student, Teaching and Admin Team Leaders and Team Members of the Quality Circles to identify the causes for the selected challenge.

Stage-4: Categorizing the Causes as Determinants of Campus Maintenance

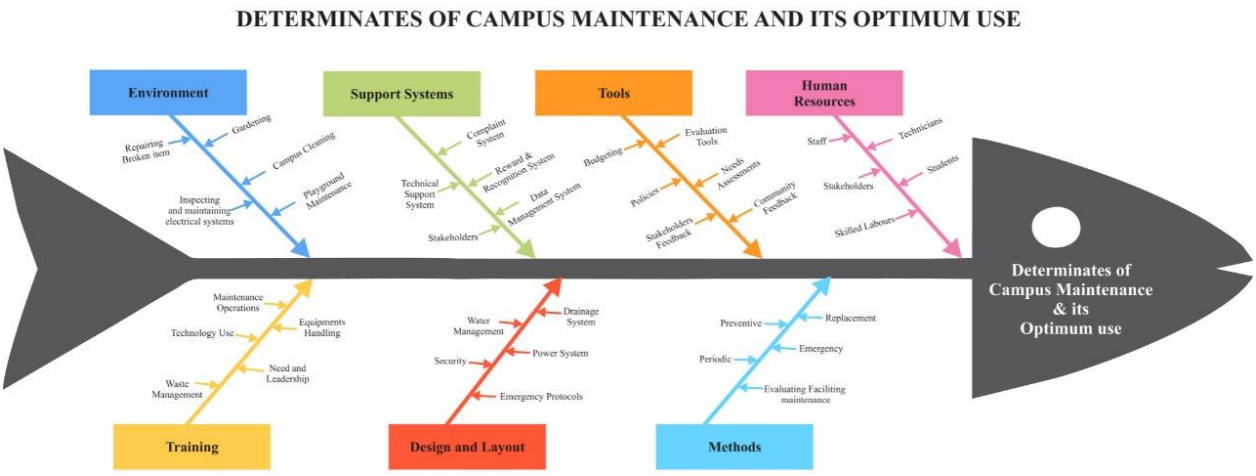
This step helps to categorize the major causes of the challenge. An Interactive Session was held with all the team members and leaders to analyze the causes and categorize them as determinants of campus maintenance.

A Fishbone diagram is developed using Multi-voting technique to identify the root causes as determinants of campus maintenance.

Team members have identified root causes for the challenge defined and placed checkmarks or colored sticky dots next to each “bone” or branch they believed are the root causes that need to be addressed.

The finalized Fishbone diagram exhibiting the root causes as determinants of campus maintenance is given below.

Figure-1: Fishbone Diagram depicting the Determinants of Campus Maintenance and its Optimum Use



In the above Fishbone diagram the Central Bone leads to the culmination of the challenges identified as determinants of Campus Maintenance and its Uses. The Seven Side Bones, Environment, Support System, Tools, Human Resource, Training, Design and Layout, Methods are identified as primary determinants contributing to the Central Bone and the Small Bones attached to the Side Bones are identified as secondary determinants contributing to the primary determinants.

The Primary determinants that make a significant impact on the maintenance of campus are identified as follows.

(i) Environment: Campus environment refers the existing College Campus including all academic, physical and support facilities.

(ii) Support System: Support denotes activities that keep users working or help users improve the ways they work.

(iii) Tools: Tools help evaluation of the College campus maintenance activities and strategies and present various approaches for accomplishing this vital task.

(iv) Human Resource: Human resource is the set of people who make up the workforce of an organization. A narrower concept is human capital, the knowledge and skills which the individual's command.

(v) Training: Training refers to a systematic setup where employees are instructed and taught matters of technical knowledge related to their jobs.

(vi) Design and Layout: Design and Layout refers to the way each area in the campus is set up and where equipments, materials and furniture are placed.

(vii) Methods: Methods and strategies adopted for effective campus maintenance.

This step helps to visualize the possible causes by drawing shorter lines off of the 'side bones' of the diagram. The small bones identified by the Quality Circles Team Members and Leaders are secondary determinants contributing to the side bones, with respect to the the primary determinants of maintenance and optimum use of campus facilities, and thereby filling the skeleton of the fish are as follows.

(i) Environment

- Cleaning
- removing trash regularly
- Gardening
- Playground maintenance
- repairing items that are broken (inspecting, repairing, and maintaining electrical systems)

(ii) Support Systems

- Complaint System
- Reward and Recognition System
- Data Management System
- Technical Support System

- Stakehholder Feedback

(iii) Tools

- Evaluation Tools
- Need Assessment
- Student Feedback
- Stakeholder Feedback
- Budgeting and Policies

(iv) Human Recourses

- Faculty Members
- Students
- Technical Support Staff
- Administration Support Staff
- Students
- Stakeholders

(v) Training

- Maintenance Operations
- Technology use
- Equipments handling, Need and Leadership

(vi) Design and Layout

- Drainage System
- Security & Power Supply
- Waste Management
- Water Management

(vii) Methods

- Preventive
- Periodic
- Replacement
- Emergency
- Evaluating Facilities Maintenance

Stage-5: Action taken

(i) Environment

- Timely and regular campus cleaning on day-to-day basis.
- Periodic cleaning of Rainwater Harvesting Wells (RHW) and Storage Tanks
- Maintenance of green landscaping with additional trees and plants at the Padma Shri Chinna Pillai Green Zone', 'Savithribai Phule Porch', 'Beno Zephine Garden', 'Kalpana Chawla Green Trial', புனிதவத பூஞ்சோல and ஆண்டாள நந்தவனம as a part of the GO GREEN Project initiated on 6th December 2019 by the Hon. Secretary of the College, to develop and maintain a clean, green and healthy environment was well monitored by the Environmental Sustainability Monitoring Committee.

- Pedestrian friendly roads inside the campus are taken care of, by different Clubs.
- Paperless Office is initiated and encouraged.
- No Single Use Plastic Zone is expanded and well maintained.
- Trees in the campus are numbered and named.
- Encouraged the use of bicycles / E-vehicles inside the campus.
- Arrangements for segregation and minimization of waste at source.
- Additional Vermi-compost and Khamba Units for preparing manure for nurturing plants in the campus using bio-degradable waste.

- Non-biodegradable waste limited in its collection are incinerated or disposed off to the Municipal Corporation trucks on day-to-day basis by adopting safe and environmentally disposal system.
- Recycling of paper waste to make paper boards, bags, packing material and covering sheets.
- Recycling of water waste from RO Plants for watering plants and to be used in Restrooms.
- Servicing of Incinerators is launched by the Rotary Club of Chennai, IT City on 31st January, 2018 in the Project Punarbava in toilets at both the College and Student Hostel to destroy sanitary napkins to create a hygienic environment.
- Renovation of Restrooms at the Computer Science Block with the support of Rotary Club of Chennai, IT City.
- Sensitizing students and community people about the Swachh Bharath Mission initiated in the campus on 24th September 2018 and Bio-degradable Waste Management to manage waste to maintain a clean and healthy environment.
- Student representatives of the Environmental Sustainability Monitoring Committee made in-charge of fixing additional posters for awareness on environmental sustainability.
- Awareness Programmes for maintenance of healthy and clean campus.
- Awareness to all Stakeholders on (i) Institutional Policy Guidelines Environmental Sustainability; (ii) Institutional Policy Guidelines for Purchase, Maintenance & Utilization of Physical, Academic & Support Facilities; (iii) Institutional Policy Guidelines for Condemnation and Disposal of Electrical and Electronic Equipments and Furniture.
- Students are made aware of the portal for Grievance and Redressed at the College website to launch online complaints regarding campus maintenance.

(ii) Support System

- **Complaint System**: Grievance and Redressed Portal at the College Website to receive complaints regarding campus maintenance.
- **Reward and Recognition System**: Timely appreciation to Faculty members, Students & Support Staff in recognition of their innovative ideas and commitment to maintain the campus.
- **Database Management System**: Systematic maintenance of appropriate records, financial audited statements and data based on the feedback of stakeholders pertaining to campus maintenance and awareness programmes to make use of the findings to modify the scope of working methods when new issues are identified and for better maintenance.
- **Technical Support System**: Qualified and trained workers appointed for technical support.
- **Stakeholder Support**: Monitory and Technical support by Stakeholders in all activities of the campus maintenance of the College.

(iii) Tools

- Online Tools to monitor monthly consumption of energy water and waste management.
- Feedback from participants to assess the effectiveness of Awareness Programmes on activities and Institutional Policy Guidelines for Environmental Sustainability; Purchase, Maintenance & Utilization of Physical, Academic & Support Facilities; and Condemnation and Disposal of Electrical and Electronic Equipments and Furniture.
- Appropriate and approved Budgeting and Procurement strategies.
- Reports submitted after physical inspections to assess the maintenance of the College campus.
- Work order system to identify, monitor and project future maintenance needs.

(iv) Human Resource

- **Administrators**: understand that campus facility maintenance affects building appearance, equipment operation, student and staff health, and student learning and acknowledge that strategic planning for facilities maintenance is a team effort that requires input and expertise from a wide range of stakeholders.
- **Support Staff**: understand a wide range of facilities operations and issues, receive training to improve their knowledge and skills related to maintenance.
- **Teachers**: recognize that facilities maintenance supports student learning and educate students about how to treat facilities appropriately, communicate their expectations for facilities as they relate to enhancing student learning.
- **Students**: consider facilities as their learning environment and treat facilities with respect.
- **Stakeholders**: recognize that campus facilities are the training grounds for future citizens and leaders, respect decision-making regarding facility use and maintenance, contribute to campus maintenance, decision-making as requested and consent to the financial obligations associated with good campus maintenance.

(v) Design and Lay out

- Energy Conservation: use of alternate sources of energy for meeting its power requirements, Environmental Sustainability Monitoring Committee to monitor identify energy saving opportunities within the College campus with the approval of appropriate committees.
- Waste Management: E-waste management includes electrical and electronic items that are beyond repair to be disposed. The Standing Condemnation Committee of the Institution prepares the list of electrical and electronic equipments to be condemned in consensus with the advice from the approved authorities. Following the Institutional Policy Guidelines for Condemnation and

Disposal of Electrical and Electronic Equipments and Furniture, the e-waste is being managed in the Institution.

- Segregation of Waste: The College gives top priority to maintain a clean and eco-friendly campus. The waste is collected as 'Biodegradable and Non-Biodegradable waste at the campus by placing different coloured bins and posters placed at appropriate points for awareness. Using Vermi-pits and Khumba Units the bio-degradable waste is converted to manure and the non-biodegradable waste is dumped in waste bins and collected by Chennai Municipal Corporation trucks every day from the College
- Waste avoidance and waste minimization at source
- Sign boards to switch off electrical appliances when not in use have been fixed at various sites
- Outdated LCD monitors are replaced with energy efficient models and old bulbs and tube lights with LED fittings for minimal and efficient consumption of energy and for the optimal usage of air-conditioners, Halls and Rooms are fitted with energy efficient split air-conditioners.
- Only LPG cylinders used in hostels and other places for cooking and automatic switches have been placed for filling up of overhead tanks in the Hostel to ensure not only power efficiency but water management also.
- The use of cost-effective, renewable energy sources whenever possible, both in new construction and existing building renovations

(vi) Training

- Educating students and employees on environmental concerns and sustainability
- Improve faculty, staff, and student awareness and encourage the sharing of experiences and expertise.
- Maintenance operations
- Use of Technology
- Equipments handling
- Leadership

- Training to improve their knowledge and skills related to facilities
  - Methods
- Preventive maintenance- is the routine, regularly scheduled maintenance of equipment to ensure its continued use and maximize its life expectancy and to increase the integrity and support the longevity
- Encouraging use of bicycles / E-vehicles
- Create pedestrian friendly roads in the campus
- Develop plastic-free campus
- Move towards paperless office
- Green landscaping with trees and plants
- Regular maintenance of drinking water taps, RO water filter and drainage lines.
- Having trash cans accessible to people in each class, working station, along corridors and long verandas, grounds and play and parking areas reduces chances of dropping trash on the floor. College campus is provided with different coloured bins to segregate the thrash for easy and safe
- Classrooms, Halls, Laboratories, Restrooms are periodically sanitized by the Maintenance Team to ensure a clean and healthy environment. Corporation personnel are also invited to the campus to ensure sensitization measures at the campus. Sanitizers are provided at the campus entry point and all toilets and wash areas are adequately provided with liquid soaps, hand wash, etc.,
- Waste Water Recycling
- Reservoirs/ Tanks/ Bore Wells
- Economical Usage/ Reduced Wastage

Stage-6: Implementation

Potential Benefits Achieved

- Reduction in maintenance cost.
- Green campus
- Frequent maintenance of the campus has been minimized.

- Providing a Safe Environment for Learning
- Effective Maintenance of campus facilities and Ground
- Effectively Managing Staff and Workers
- Ensure cleanliness, orderliness, and safety of campus facilities
- Extending the useful life of buildings Increase energy efficiency
- Decreasing equipment replacement costs over time
- Decreasing renovation costs
- Decreasing overhead costs (such as utility bills) because of increased system efficiency

Achievement

Clean, Healthy and Green Campus

Suggested Modifications

- Disaster Planning or retrofitting College buildings to withstand natural disasters
- Developing emergency preparedness plans, and using campus buildings to shelter community members during emergencies.
- Energy Smart campus: Planning how to increase energy efficiency and improve the learning environment.
- Facilities Audit: A Process for Improving Facilities Conditions. It is designed to help a facility manager assess the functional performance of buildings and infrastructure and provides information about how to quantify maintenance deficiencies

Conclusion

As the College believes that providing a good ambience enhances the learning performance of students, it prioritizes the provision and maintenance of a hygienic environment. In line with this objective, the College focuses on imbibing values of maintaining a clean and healthy environment by planting a good number of trees and

adopting well planned system for maintenance of academic, infrastructural and support facilities.

The responsibilities and organizational arrangements for Environmental Sustainability Policy lie with a variety of personnel within the campus. The members of the Energy Consumption Monitoring Committee, Water Management Committee and Waste Management Committee that include representation from all levels of the Institution including students will meet periodically and report to the Advisory Board, made up of the College Secretary, Principal and the IQAC Co-ordinator to develop, implement, and maintain plans for environmental sustainability and provide leadership in the development of policies, practices, and resources that promote environmental sustainability among students through value-based education and other community-based activities.

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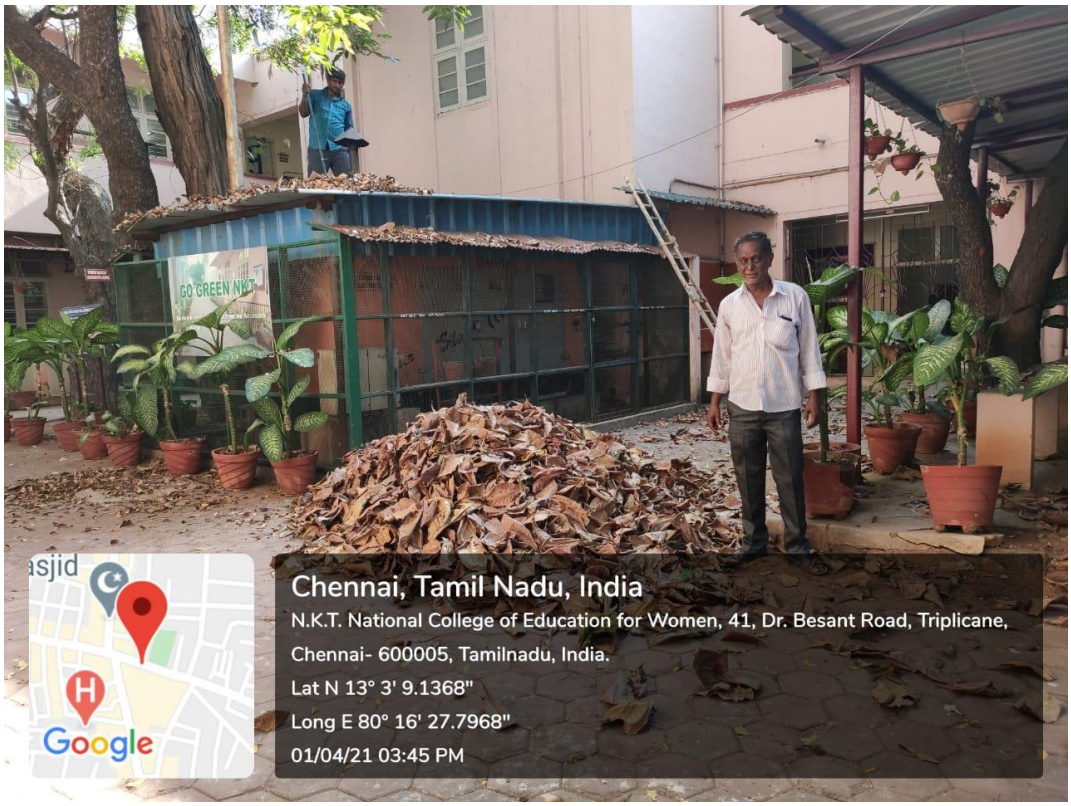
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