

Green Practices in TVET Institutions

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Abstract

Green Practices means to pursue knowledge and practices that can lead to more environmentally friendly, ecologically responsible and socially acceptable, which can help protect the environment and sustain its natural resources for present and future generations. Greening is a process, or a journey, rather than an end-point. Greening is a way of life. Greening TVET is a journey and it will continue to spread the message as change agents in whatever way we can. A green campus is a cleaner, safer and healthier place to live and work. A Green Campus is a place where environmental friendly practices, education and training combine to promote sustainable and eco-friendly practices in the campus. The green campus concept offers an institution the opportunity to take the lead in redefining its environmental culture and developing new paradigms by creating sustainable solutions to environmental, social and economic needs of the mankind.

Keywords: TVET, Green Practices, Green Campus

Introduction

Green practices is an essential issue for a forward-looking Technical and Vocational Education and Training (TVET), and green skills are an integral part of vocational competence. Greening the campus is all about sweeping away wasteful inefficiencies and using conventional sources of energies for its daily power needs, correct disposal handling, purchase of environment friendly supplies and effective recycling program. Institute has to work out the time bound strategies to implement green campus initiatives. These strategies need to be incorporated into the institutional planning and budgeting processes with the aim of developing a clean and green campus.

Green Campus Initiatives:

The TVET institutions should seek to improve its energy practices to reduce expenses while maintaining comfort and quality of indoor and outdoor environment. Reduce its overall environmental footprint through all possible means, both active and passive. It should concentrate on:

- 1) Impact on the land
- 2) Energy savings
- 3) Water efficiency
- 4) CO_2 Emissions reduction
- 5) Improved indoor environmental quality
- 6) Stewardship of resources

Every TVET institutions manager will work with students, faculty and support staff to foster a culture of self-sustainability and make the entire campus environmental friendly. The Green Campus Initiatives (GCI) will enable the institutions to develop their campuses as a living laboratory for innovation. Saving energy should be the motto of every day's working in each TVET institutions. Every institute will purchase and use only energy saving equipment.

The following practices in TVET institutions can lead to more environmentally friendly and ecologically responsible decisions and lifestyles, which can help protect the environment and sustain its natural resources for current and future generations:

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|-------------------------------|--|
| 1) Waste Management | 9) Geothermal power |
| 2) 100% Renewable Energy | 10) Climate neutrality |
| 3) Native Landscaping | 11) Recycling Bin for e-waste |
| 4) Solar Power | 12) Complete ban on Polythene at campus |
| 5) Institute community garden | 13) Digital Library/E-learning Center |
| 6) Use more of LEDs than CFL | 14) Bike Friendly Campus |
| 7) Digital library/e-library | 15) Center for Sustainable Climate Solutions |
| 8) Smart lighting | 16) Green Buildings |

Waste Management

Waste management is the precise name for the collection, transportation, disposal or recycling and monitoring of waste. This term is assigned to the material, waste material that is produced through human being activity. This material is managed to avoid its adverse effect over human health and environment. Every institute has to work in the direction of waste water management particularly in student's hostels. Water flow restrictors on bathroom faucets and showers, low water flow toilets and automated urinal flushers should be used to cut down campus water use. Every TVET institutions should take all necessary measures to implement waste water management /rain water harvesting and other waste.

Waste Management System:

Waste management encompasses management of all processes and resources for proper handling of waste materials, from maintenance of waste transport trucks and dumping facilities to compliance with health codes and environmental regulations.

There are 5 types of waste:

- a) Liquid Waste
- b) Solid Rubbish
- c) Organic Waste
- d) Recyclable Rubbish
- e) Hazardous Waste.

A number of waste prevention techniques are available, and they are commonly summarized as the **4Rs: Reduce, Reuse, Recycling and Recovery**. Reduce, Reuse and Recycling are known in the industry as the **3Rs**. Enterprises sometimes focus only on the first three in resolving waste management problems.



Fig: 3R's Program

Reduce, Reuse & Recycle: The waste hierarchy is a classification of waste management options in order of their environmental impact, such as: reduction, reuse and recycling.

Reduce: "Reduce" means using fewer resources in the first place. This is the most effective of the three R's and the place to begin. Use of resources can be reduced by:

- a) Buying products made from post-consumer recycled materials, especially paper and bathroom tissue.
- b) Choosing electronics and appliances that are energy-efficient.
- c) Buying stuff made close to home. Less energy was used transporting them to the store.
- d) Buying used.
- e) Avoiding goods made with materials whose extraction or processing are especially destructive.
- f) Avoiding overly packaged goods.
- g) Avoiding things made with toxic materials.
- h) Cutting back on water use.
- i) Wasting less energy on lights and equipment.

Reuse: Before disposing or recycling of anything, it should be considered for reuse. Reusing keeps new resources from being used for a while longer, and old resources from entering the waste stream. It's as important as it is unglamorous. Think about how you can do it more.

Recycle: Recycling is a process to change materials (waste) into new products to prevent wastage of potentially useful materials, reduce the consumption of fresh raw materials, reduce energy usage, reduce air pollution and water pollution by reducing the need for "conventional" waste disposal, and lower greenhouse gas emissions as compared to plastic production.

Recycling Collection Schemes

Recycling collection schemes aim to, firstly, divert more waste from landfill and, secondly, facilitate efficient, profitable recycling. However, the debate rages on the proper method for meeting these targets:

- 1) "Co-mingled" collections: Separating recyclables takes time, whereas co-mingled (mixed waste) collections boost overall recycling levels.
- 2) Separate collections: Separate collection is advantageous as costs increase for co-mingled collections as more collection and separation is required for the recovery process. Furthermore, co-mingled waste leads to an increased risk of contamination.
- 3) Compromised collection: A good compromise is the dual bag method adopted by many.

To reduce contamination and improve recycling efficiency:

- a) Wash (Pour away excess liquid and rinse the container (use your washing-up water)
- b) Squash (Crush metal cans and Squeeze plastic bottles flat to expel as much air as possible)

These steps help prevent contamination and reduce the volume of recycled materials, making collections more energy efficient.

Use of Renewable Energy

Renewable energy is generally defined as energy that comes from resources which are continually replenished on a human timescale such as sunlight, wind, rain, tides, waves and geothermal heat. Direct or indirect energy from the sun can be transformed into electricity via a number of alternative and renewable sources. Electrical energy can be produced from Wind, Hydro, Tidal and Wave Energy, Photo-voltaic Cells, Solar Thermal and Bio-energy (Biomass and Biogas) cogeneration facilities.

Green Skills:

“ Skills for sustainability, also known as green skills, are the technical skills, knowledge, values and attitudes needed in the workforce to develop and support sustainable social, economic and environmental outcomes in business, industry and the community.” Green skills helps production to advance to more environmentally conscious practices. A ‘green’ worker is a more employable worker; a ‘green’ workforce will enhance the profitability of the enterprise.

Green Jobs

Green jobs, as defined by the International Labor Organization (2011) refer to employment in any industry that contributes to preserving or restoring environmental quality in that sector and allowing for sustainable development. Specifically, but not exclusively, this includes jobs that help protect ecosystems and biodiversity; reduce energy, materials and water consumption through high efficiency strategies; de-carbonize the economy; and minimize (or altogether avoid) generation of all forms of waste and pollution.

Green jobs encourage the following activities:

- a) The adaptation and mitigation of resources
- b) Contribution in preserving environmental quality
- c) Promotion in protecting ecosystems and biodiversity
- d) Leadership in reducing energy, materials and water consumption and
- e) De-carbonization of the economy and encouragement of the reduction of pollution and wastes.

On the other hand, green employment practices encourages the use of energy-efficient materials in building materials and maintenance, proper solid waste management, controlled water supply and reduction of CO_2 and the use of green technology.

Shift in Skills

The green practices in TVET causes unprecedented shifts in skills requirements. These changes include shifts in the ways in which jobs are performed (which lead to a need to retrain and up skill displaced workers so they can be employed in other sectors); the emergence of new skilled occupations (for which individuals need to be trained and acquire qualifications); and the greening of existing jobs (which also demands up skilling of those employed). Greening TVET requires much more integration of skills and employment development policies into a green and employment development policies into a green economic agenda. Transitioning to a green economy promises access to new jobs, but also creates changes in the scope and character of existing jobs. Without an adequately trained workforce, this scenario will give rise to skills shortages in some sectors even though jobs are available in others skills development strategies that facilitate the transition to the green economy.

Energy audit

Energy Audit is a periodic examination of an energy system to ensure that energy is being used as efficient as possible. It is an inspection survey and analysis of energy flows, for energy conservation in a building, process or system to reduce the amount of energy input into the system without negatively affecting the output(s). Energy audit is a service where the energy efficiency of an institution is evaluated by a person using professional equipment, with the aim to suggest the best ways to improve energy efficiency. The purpose of an energy audit is to analyze the energy flows in a building, and understand its energy dynamics. An energy audit may involve recording various characteristics of the building envelope including the walls, ceilings, floors, doors, windows, and skylights. For each of these components the area and resistance to heat flow is measured or estimated. The leakage rate or infiltration of air through the building envelope is of concern, both of which are strongly affected by window construction and quality of door seals such as weather stripping. The goal of this exercise is to quantify the building's overall thermal performance. The audit may also assess the efficiency, physical condition, and programming of mechanical systems such as the heating, ventilation, air conditioning equipment, and thermostat.

An energy audit may include a written report estimating energy use given local climate criteria, thermostat settings, roof overhang, and solar orientation. This could show energy use for a given time period, say a year, and the impact of any suggested improvements per year. The accuracy of energy estimates are greatly improved when the billing history is available showing the quantities of electricity, natural gas, fuel oil, or other energy sources consumed over a one or two-year period. Some of the greatest effects on energy use are user behavior, climate, and age of the building. An energy audit may therefore include an interview of the homeowners to understand their patterns of use over time. Advances in computer-based thermal modeling can take into account many variables affecting energy use.

Energy Management

Energy management can be broadly defined as the proactive, organized and systematic management of energy use in a building or organization to satisfy both environmental and economic requirements. The objectives of energy management are resource conservation, climate protection and cost savings, while the users have permanent access to the energy they need. It is connected closely to environmental management, production management, logistics and other established functions.

Energy Management encompasses a wide range of activities and expertise in the optimal use of energy.

This includes the areas of:

- a) Development of management strategies programs and plans.
- b) Implementation of techniques, technology and tools.

Conclusion

Green practices is an essential issue for a forward-looking Technical and Vocational Education and Training (TVET), and green skills are an integral part of vocational competence. Greening TVET is one of the key areas where human resource for future can be developed. The TVET institutions manager always should strive to develop its institutions on a self –sustainable basis in the areas of power, water and cleanliness. The faculty, staff and students have to contribute collectively to develop an eco-friendly sustainable campus and disseminate the concept of eco-friendly culture to the nearby community and wherever possible. TVET institutions should adopt green skills and green jobs initiatives towards the creation skilled workforce to fuel the economy.

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