EAST WEST UNIVERSITY

Project Report on Green Education

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Section: 3

Project Title: Exploring Methodologies in Green Education

Submitted By:

Sabrina Jahan (2021-3-60-252)

Ishraque Manzur (2021-3-60-130)

Tasfina Haque (2021-3-60-131)

Kanij Fatema (2021-3-60-095)

Sheikh Rayana Jafa (2021-3-60-146)

Submitted To:

Amit Mandal

Lecturer

Department of Computer Science & Engineering

East West University.

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Introduction :

Green Education is an educational framework that focuses on fostering environmental awareness and sustainable practice. It mostly highlights teaching the general public about the importance of observing natural resources, reducing ecological imbalance, and the significance of our ecosystem. It integrates the principles of renewable energy literacy on climate change and how to be environmentally conscious. One of the significant benefits is the promotion of adopting habits such as recycling, conserving energy, and supporting renewable resources.

Despite all these, there are many challenges in properly implementing the core objectives of green education. After thoroughly reviewing a plethora of research papers on green education we have determined a lot of inefficiencies and lackings in the proposed methodologies and course of action. Some of these challenges are:

01) Energy inefficiency:

- Inefficient resource utilization of e-learning platforms and personal computing systems.
- High Carbon footprints of University campuses and personal devices.

02) Lack of Awareness:

- Limited knowledge of green practices among students, teachers and institutions
- Minimal incorporation of sustainable concepts into student's curriculum and organizational policies.

03) Cost barriers and infrastructures:

- Challenges in endorsing energy-efficient infrastructure due to cost constraints, mainly in rural areas.
- Reliance on inconsistent grid electricity in underdeveloped regions

04) Policy gaps:

- Absence of standard green computing guidelines and initiative.
- Limited support of authoritative figures in positions of power.

05) Accessibility Issues:

- Lack of centralised repositories for sustainable resources.

In order to tackle these issues a wide range of methodologies have been employed which includes technological innovation, energy optimization techniques and effective awareness campaigns. The common methodologies are as follows:

01) Energy Optimization Techniques:

- Deployment of virtual desktop infrastructure (VDI) within institutions to reduce energy loss.
- Integration of virtual machine migration (VMM) and green networking in e-learning platforms.

02) Awareness Campaigns and Educational Assimilation:

- Creating tailored awareness programs targeting students and educators.
- Development of green-based curriculum and topics regarding renewable power sources.

03) Technological Solution:

- Developing prototypes and testing of standalone solar power devices for rural education.
- Development of metadata-driven repositories to organize and improve sustainable resources.

04) Participatory and Practical Approach:

- Hands-on programs which include participatory farming to raise ecological awareness.
- Reflective learning sessions regarding green initiatives.

05) Analytical Tools:

- Utilization and factor analysis, principle component analysis (PCA) and statistical tests to refine and assess green initiatives.
- Life Cycle Analysis to evaluate energy efficiency in organizational operations.

06) Policy Reforment:

- Advocating organizational awareness and government incentives to adopt green computing.

- Conducting energy audits and adopting energy-efficient campus management strategies.

Refining Specific Problems related to reviewed papers

The global emphasis on sustainability and environmental conservation underscores the importance of integrating green education into academic institutions. Despite such a necessary obligation, a critical challenge persists**: the lack of awareness of green education among students.** This problem limits the adoption of green practices and technologies, hampering efforts to mitigate climate change and promote sustainable development. This report narrows down the broad challenge to focus on methodologies addressing the lack of awareness of green education.

Analyzing Methodologies Addressing Challenges

To address the lack of awareness of green education, the studies outlined in the mapping document propose several methodologies. A comprehensive analysis reveals key strategies which are discussed below:

1) Awareness Campaigns

- **Study Example:** The study titled “Assessing University Student’s Attitude Toward Green Computing Practices” identified inconsistent awareness among students and proposed tailored awareness campaigns. These campaigns aimed to engage students through targeted messages that resonated with their demographic and interests.

- **Implementation:** Awareness campaigns included workshops, interactive sessions, and media-driven initiatives to emphasize sustainable practices' significance and impact on daily life.

- **Outcome**: The campaigns achieved an 80% agreement among students on the importance of green practices, highlighting a positive shift in attitude.

2) Integration of green Topics into Curriculum

- **Study Example:** The study captioned “Integrating Sustainability into Undergraduate Computing Education” addressed the limited focus on sustainability in traditional curricula. The study introduced modular green computing topics and student-led projects.

- **Implementation:** The modular approach included lectures, case studies, and hands-on projects. Students explored topics such as energy-efficient algorithms, lifecycle analyses of computing devices, and carbon footprint calculations.

- **Outcome:** Post surveys demonstrated a 90% improvement in student's understanding of green computing principles.

3) Participatory Approaches

- **Study Example:** "Implementing Green Education of Urban Families in Beijing" highlighted participatory farming programs to bridge ecological awareness gaps. While this was urban-focused, it underscores the value of experiential learning.
- **Implementation:** Hands-on activities like farming sessions encouraged participants to engage directly with green practices.
- **Outcome:** Behavioral changes and increased ecological awareness were observed, demonstrating the potential for participatory methods to foster deeper understanding.

Identifying Limitations and Gaps

While these methodologies effectively address aspects of green education awareness, they exhibit certain limitations and awareness, they exhibit certain limitations and gaps that warrant further exploration. Some problems we have discovered after thoroughly analyzing the specific papers are:

1) Limited Reach of Awareness Campaigns

- Tailored awareness campaigns may only reach a fraction of the targeted audience. Students who are less engaged with environmental issues or belong to non-IT-related fields remain more or less unaffected. The focus on demographic-specific tailoring might inadvertently exclude broader student populations

2) Scalability of curricular Integration

- While integrating green topics into curricula has shown some promise, its adaptability is often constrained by institutional resistance, resource limitations, and the absence of standardized frameworks. The modular approach, though effective, requires extensive faculty training infrastructure upgrades.

3) Engagement in Participatory Approaches

- Participatory methods rely heavily on voluntary engagement. Urban families or students with limited time or competing priorities might not actively participate. Additionally, these methods are labor-intensive and require substantial investment in facilities and logistical planning.

4) Lack of Technological Leveraging

- Despite the expansion of digital tools, very few methods leverage advanced technologies such as gamification, AI-driven personalization, or virtual reality to enhance awareness. These tools could potentially make green education more accessible and engaging to the general public.

Addressing the Lack of Awareness of Green Education In East-West University

The critical challenge of limited awareness of green education amongst students and educators necessitates various combinations of solutions. This research plan delves into in-depth research and resource gathering to address the challenges effectively.By leveraging tools such as tailored surveys, relevant datasets and frameworks, this plan outlines methodologies and evaluation metrics aimed at enhancing awareness of green education, particularly at East West University.

In order to effectively address this challenge of awareness regarding green education, a combination of tools procured datasets and frameworks are significant.These elements would provide us with a strong foundation to propose a targeted solution and evaluate outcomes.

Engaging University Authorities

To initiate efforts to enhance green education awareness, the first step involves engaging with the university's higher authorities. A formal one-to-one discussion will be conducted to present the gravity of the lack of awareness and propose actionable solutions. This meeting highlights the importance of integrating sustainability into the university's culture and academic framework. Key discussion points include

- The current state of awareness among students and its importance for long-term sustainability goals
- Proposed strategies for awareness-building, including curriculum integration, workshops, and campaigns
- Cost-effective measures to ensure minimal financial burden while maximizing impact

After securing the support and approval of the university authorities, the initiative will gain institutional backing, which is critical for ensuring successful implementation and participation.

Student Engagement through Questionnaires

Following the discussions with university authorities, the next step involves engaging the targeted audience-" **The students**". A carefully designed questionnaire will be distributed to gather their responses and perspectives on green education.

The questionnaire will be developed using Google Forms to ensure cost efficiency and smoothness of distribution. Questions will be tailored to assess students's current knowledge, attitudes, and practices regarding green education. Examples of potential questions are:

- "How familiar are you with green computing practices?"
- "What sustainable behaviors do you currently adopt in your daily life"
- "What role do you think green education should play in your academic journey?"

The questionnaire will be distributed digitally through university email, social media platforms and academic groups to ensure broad reach. Responses will be analyzed to identify key trends, gaps, and opportunities for intervention.

Cost-Effective Implementation

One of the core principles of this research plan is minimizing costs while maximizing impact.The use of digital tools like Google Forms eliminates the need for physical resources, ensuring a sustainable and budget-friendly approach. Additionally, the reliance on existing university communication channels for both engaging authorities and distributing questionnaires further reduces expenses. The focus on leveraging internal resources and digital platforms ensures that the project remains both economically and environmentally sustainable

Experimental Work-Plan

Phase 1: Authority Engagement

- Conduct one-to-one discussions with university authorities to gain institutional support and refine strategies.

Phase 2: Data Collection through Questionnaires

- Design and distribute a tailored questionnaire to students using digital platforms.

- Collect responses over a specified timeframe to ensure diverse participation.

Phase 3: Data Analysis and Strategy Development

- Analyze questionnaire responses to identify awareness levels, gaps, and key areas of intervention
- Create targeted campaigns based on findings.

Phase 4: Implementation and Evaluation

- Develop awareness initiatives with ongoing feedback mechanisms to measure effectiveness.

Experimentation

The initiative commenced firstly with discussions directly with the higher authority, in this case, the chairpersons of each department. They provided institutional approval for campaigns aimed at increasing awareness of green education through direct campaigning. A comparatively easy questionnaire, designed using Google Forms, was given out to the students which had the sole purpose of assessing students' familiarity with green computing concepts, interest in sustainability, and their personal practices regarding energy conservation. Following the survey, an analysis of student responses revealed notable gaps in understanding what green computing actually is, which led to the need for targeted interventions.

Workshops were organized to address the first problem which was " What is green computing". Later on, sessions focused on imparting practical knowledge on energy efficient software usage, effective introduction of cloud storage and its benefits, and strategies to reduce electronic waste were conducted directly within university grounds. This enabled the students to grasp a better perspective on what green education truly represents. Attendees were marked individually to maintain the severity of the sessions and their impact. This resulted in the approval of mini-courses that ensure a sustainable foundation for future initiatives. All activities were conducted utilizing very little funding and university resources made it more cost-efficient

Result and Comparative Analysis

Survey responses highlighted that the majority of students had minimal or close to zero knowledge regarding green computing. For instance, the greater number of students who answered the questions in the form were inconclusive in their choice as many of them were in the category of 'Neutral". Among the items which the majority of respondents could not answer correctly are "PC recycling increases environmental pollution", "Laptops consume more power than desktops", "Repeatedly shutting down

and starting up a computer will save-energy", "Screen saver saves energy". Some of the respondents were able to answer some of the questions, by giving the answers thoroughly. The engagement with university authorities led to a breakthrough in accepting green computing topics into the academic curriculum. Although the immediate implementation was limited to pilot courses, this development represents a significant step toward institutionalizing green education. Comparing these outcomes with benchmarks from similar initiatives at other universities, such as Shenyang University, which reported a 20% increase in awareness post-intervention, East West University achieved a comparable 15% improvement in student awareness**(by our assumption)**, reflecting the effectiveness of the approach.

In spite of all these initiatives, the lack of immediate curriculum change still hinders the long-term impact. This ultimately emphasizes the need for sustained efforts and further collaboration with institutional stakeholders to realize the integration of green computing.

Enhancing Green Education Initiatives and Implications for Future Directions

Working on the outcomes and feedback from the experimentation phase, the structure for raising awareness of green education at East West University has undergone significant changes. Firstly, student engagement has been identified as a key area of improvement. Despite workshops being moderately successful, participation needs to be further improved by introducing interactive formats like hackathons, peer-led sessions on green computing and its significance as well as student-friendly competitions. Such activities are designed to appeal to diverse learning styles and create a more comprehensive learning environment. Moreover, using digital tools like gaming platforms, and mobile apps will increase the possibility of a smooth pace of learning. Secondly, curriculum integration also requires a broader and flexible approach. Pilot courses will need to include more advanced topics such as artificial intelligence in green computing, industry case evaluations, and an in-depth focus on the global economy. The feedback will need to include a direct student-to-faculty discussion during specified time frames which will ensure more curriculum dynamic. Finally, in order to completely sort out these changes, a dedicated and willing task force will need to oversee the monitoring and evaluation process. This team will collect and analyze the information on student participation and behavioral aspects of the initiatives.

This initiative does not just address the immediate challenge, rather it also paves the path for a broader, systematic change in sustainability education for all educational institutions. Future directions will include the extension of the programs to other organizations, incorporation of cutting-edge technology such as augmented virtual reality for immersive learning, and forming partnerships with industries that provide

practical exposure to sustainable practices. This continuous evolution will potentially create a generation of environmentally conscious and proactive individuals who are ready to tackle global challenges surrounding sustainability.

Conclusion

Addressing the lack of awareness of green education among East-West University students requires a structured and cost-effective approach. This research plan ensures actionable insights and impact interventions by engaging with the university authorities and utilizing tailored questionnaires for data collection. The refinement of our method completely relies on the feedback of the students, the cooperation of the higher authority, and the willingness to change. As this initiative continues to evolve and improve, it creates the opportunity to not only foster a culture of sustainability and renewable habits but also to serve as a replicable model for other organizations. Furthermore, this work contributes to the broader goal of empowering future generations with knowledge and encouragement to address all types of global issues effectively.