



Exploring Teachers Perceptions Regarding Possibilities and Potentials to Integrate Environmental Education in University Curriculum

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Abstract

Environmental education is much needed to create awareness and responsibility concerning environmental challenges and sustainability. The purpose of the study was to find out how teachers perceived the opportunities and potentials of introducing environmental education to the university curriculums. With the increased importance of environmental literacy, the study highlights the importance of institutions of higher learning to impart knowledge and skills on to students to enable them deal with environmental challenges appropriately. Qualitative research design was used to have a detailed insight into the opinion of teachers. Faculty members in two departments of higher education institutions in Baltistan were interviewed (semi-structured) in two departments, namely the Environmental Sciences and Educational Development. The analysis was done using thematic data on major trends and perspectives. The results showed that the teachers have a good conceptual knowledge on environmental education and believe that it should be part of the university curriculum. They suggested the use of modern technologies, project-based learning, and field-based activities to make students more engaged and have a better practical knowledge. Besides, participants noted that teacher training programs are necessary in order to enhance the abilities of educators to foster environmental awareness and sustainability. Finally, the study notes that teachers have good attitudes towards implementing the environmental education in higher education. The integration of this content into the curriculum through the innovative teaching methods, and the availability of professional development prospects can be crucial to making graduates environmentally aware and aiding sustainable development in academic institutions.

Keywords: Environmental literacy, Higher education, University curricula, Teachers' perceptions, Qualitative research, Semi-structured interviews, Thematic analysis, Modern technologies, Project-based learning, Field-based activities, Teacher training, Professional development, Sustainable practices, Innovative teaching strategies, environmentally conscious graduates, Sustainable development, Baltistan



Introduction

Environmental education has become one of the most significant fields of concern in the modern world, especially, following the pace of increasing climate change and the extensive social, economic, and ecological impact. In recent years, the rate of environmental degradation has been increasingly alarming and the governments, researchers, and educators have been forced to rethink the purpose of education in creating environmental awareness and sustainable practices. The rising popularity of environmental education as a driver of sustainability is an indicator of a growing agreement in the view that education should not only be seen as a source of knowledge but also as a transformative power in terms of influencing attitudes, values and behaviors towards environmental stewardship (Tilbury, 2021).

In the world, environmental education has taken the centre stage in the sustainable development agenda. The United Nations Sustainable Development Goals (SDGs) especially SDG 4 (Quality Education) and SDG 13 (Climate Action) focus on the adoption of sustainability concepts within the educational systems at all levels. According to the UNESCO Education for Sustainable Development (ESD) Framework 2030 (2020/2024), the changes in the field of curricula are necessary to enable learners to be prepared to face the complexities of the twenty-first-century environment. It encourages interdisciplinary, participatory, and transformative methods of learning that encourage critical thinking, problem-solving, and community involvement (UNESCO, 2023). Higher education institutions (HEIs) are becoming increasingly considered the agents of change in this global environment and have a role to play in developing environmentally literate graduates that can help build sustainable societies (Barth, 2023).

In this global trend, a good number of developing nations even in Pakistan have lagged behind to institutionalize environmental education at the higher education systems. Environmental issues are getting a more prominent air in Pakistan, as the increasing temperatures, melting glaciers, water shortage, and air pollution make the existence of people and livelihoods in danger. Nevertheless, the integration of the environmental issue into the education system, and in particular, into the university one, is still not very refined and touched upon (Hussain and Batool, 2022). The topics of environmental awareness, sustainability competencies, or interdisciplinary problemsolving are still given little attention in most higher education curricula, which still emphasize the traditional disciplinary content. Consequently, students tend to graduate without much knowledge on environmental aspects of their disciplines or competencies required to facilitate sustainable development.

The disruptive nature of universities as institutions in implementing sustainability by reforms to their curricula, research, and campus life has been highlighted in recent international studies (Sterling, 2022; Wals and Leicht, 2021). Examples like whole-institution models and green campus frameworks show how universities can revise their teaching and operations as well as community outreach to incorporate the sustainability principles in their work. Nevertheless, a study on the Pakistani setting shows that there is a gap: not many universities came up with explicit policies or pedagogical models of environmental education, and even fewer of them studied the attitudes of educators towards its use (Ahmad, 2021). Lack of empirical research investigating the attitudes of the teachers is a significant gap in research, as it is the faculty members who will be key in terms of applying the ideas of sustainability to the curriculum and classroom activities.

Thus, the current research will help fill this gap by examining the views of university educators concerning the opportunities and potential of environmental education in the higher education



curriculum. Precisely, it aims at gaining insight into the ways in which teachers conceptualize environmental education, the strategies which they would incorporate in the process of integration, and the challenges which they are likely to encounter in the process of integration. In exploring these dimensions, the research paper adds to the evidence-based knowledge on whether institutions of higher learning are prepared to embrace sustainability-oriented practices.

The importance of the study is that it may be used to guide the national education policies and institutional strategies in order to meet the SDGs and especially those of quality education and environmental sustainability. The sector of higher education in Pakistan is currently going through reforms (related to innovation, employability, and digital transformation), and including environmental education in this reform agenda would make graduates holistic and future-ready. Besides, this study is practical in pinpointing the thinking of teachers and suggestions that can be used to enlighten curriculum developers, policymakers, and academic heads in ensuring sustainability in all fields.

The research falls within a larger theoretical construct that considers environmental education as a multidimensional process which involves the acquisition of knowledge, skills development and formation of attitudes. It focuses on experiential and inquiry-based learning styles that help to connect students to environmental problems in the real world and promote civic responsibility. This strategy is in line with the vision of Education for Sustainable Development (ESD) where they require pedagogies to enable learners to be change agents in their societies (UNESCO, 2023).

Besides addressing a gap in the nation, the study is also a response to global discourse of transformative education. As has been proposed by scholars, including Tilbury (2021) and Barth (2023), sustainability education needs a paradigm shift, which is a shift in the focus of teaching towards a learner-centered approach to education based on values. This change requires that the universities re-conceptualize not only what they are teaching, but also how they are teaching it, such that environmental literacy is a cross-cutting factor throughout all the disciplines. In this respect, the beliefs, attitudes, and pedagogical competencies of teachers play a crucial role because they are the main drivers of the effectiveness of the curriculum integration process.

To sum up, environmental education ceased to be a marginal issue but became one of the priorities of higher education in the contemporary world. Intellectual and social institutions such as universities in Pakistan have the responsibility of informing students to face the challenges posed by environment through knowledge, innovation and ethical involvement. It is against this background that this study seeks to serve this purpose of providing insights on the views of teachers regarding the possibilities and prospects of incorporating environmental education in the university curriculum. Through an interdisciplinary approach to research, practice, and policy, the study will hope to contribute to the creation of a more sustainable, informed, and resilient educational environment in Pakistan.

Literature Review

Evolving Perspectives on Environmental and Sustainability Education

Over the past years, environmental education (EE) has developed into a holistic and transformative approach rather than the content-based one in accordance with the demands of sustainable development. Traditionally, EE was aimed at bringing knowledge about the natural world, whereas the modern methods are based on developing sustainability-oriented values, competencies, and social responsibility (Sterling, 2022). The introduction of Education for Sustainable Development



(ESD) is a paradigmatic change, which is not only aimed at developing environmental literacy, but also at contributing to systemic thinking, ethical reasoning, and participatory action among students (Tilbury, 2021). This is a development that is based on the realization that environmental issues that are related to global warming, biodiversity decline and pollution can not be addressed based on scientific knowledge alone but necessitates behavioral, governance and educational processes to change.

This change is supported by the UNESCO Education for Sustainable Development 2030 Framework (ESD 2030) that makes education a transformative driver to sustainability. The framework highlights the significance of applying sustainability at all education levels in the interdisciplinary curriculum, hands-on experience, and partnership between the academic and community stakeholders (UNESCO, 2023). This integration is the shift in thinking toward the concept of education about the environment to education for sustainability, with the learning outcomes that touch on environmental stewardship, civic engagement, and socio-ecological responsibility (Barth, 2023).

Sustainability Education and the Sustainable Development Goals (SDGs)

One of the approaches to revamping the education systems in the world has taken the form of the United Nations Sustainable Development Goals (SDGs) which were adopted in 2015. These include SDG 4 (Quality Education) and SDG 13 (Climate Action) which are especially applicable to the sustainability education. ESD 2030 roadmap helps the universities not only to introduce sustainability principles into environmental sciences programs, but also to sustainability through social sciences programs, business, engineering, and teacher education (UNESCO, 2023).

Recent research (Mahmood et al., 2023; Leicht et al., 2022) demonstrates that the inclusion of SDG framework with higher education promotes the level of critical awareness among students and creates a sense of global citizenship. Universities that adopt SDG-oriented curriculums have indicated higher student involvement in the sustainability projects and community outreach programs. Furthermore, the whole-institution perspective suggested by Wals and Leicht (2021) emphasizes that the sustainable change involves integration on the teaching, research, operations, and governance levels, thus establishing a culture of sustainability in institutions.

Nevertheless, the application is still not uniform across the board. Institutional sustainability policies and green campus programmes are being embraced in developed contexts in universities. On the other hand, sustainability education is still in its early stage in developing nations like Pakistan, and policy coherency is limited with poor institutional frameworks (Ahmad, 2021; Hussain and Batool, 2022). The imbalance highlights the significance of localized approaches that would be consistent with the global objectives and respond to the contextual educational realities.

Institutions of Higher Learning as Agents of Sustainability

Higher education institutions (HEI) are very instrumental in creating future leaders and decision-makers. Sterling (2022) says that universities should shift towards knowledge-disseminating organizations to become transformational learning communities that support sustainable thinking and social innovation. ESD recommends that higher educational institutions should incorporate sustainability in all their disciplines, promote interdisciplinary research, and exemplify sustainability in college operations.



The Asian and European university experience demonstrates that the introduction of sustainability into the institutional policy and curriculum can improve the competencies of students in critical thinking, teamwork, and ethical decision-making (Barth, 2023; Wals and Leicht, 2021). However, there are still difficulties such as insufficient faculty training, resource shortage, and prevalence of exam-based pedagogies (Mahmood et al., 2023). Professional development and institutional support systems should be empowering to teachers to facilitate the practice of sustainability orientation teaching in an attempt to bring meaningful transformation.

Reforms in the field of higher education in Pakistan have always focused on employability and technology with little consideration given to sustainability education. Research also suggests that though there are universities that have launched environmental science courses, there is lack of cross-disciplinary integration and institutional coordination (Hussain & Batool, 2022). Therefore, EE tends to be limited to the departments of science, leaving out the social, ethical, and civic aspects of it. This loophole restricts the ability of higher education institutions to produce sustainability-sensitive graduates who can help in achieving the SDGs.

Ecological Pedagogies and Teacher Perceptions towards Environmental Education.

Perceptions and attitudes of teachers, and their competencies are the key determinants of successful environmental education. Tilbury (2021) highlights that university teachers are change agents that can convert sustainability principles to a valuable learning experience. They can do so, however, because it is related to professional knowledge, institutional support, and access to pedagogical materials. A study conducted by Mahmood et al. (2023) in South Asian universities established that a good number of teachers are not only in agreement with the concept of sustainability education, but they also do not have formal training or curriculum guidance on how to effectively apply it.

Also, research indicates that faculty members tend to view sustainability as an additional load instead of being an academic objective (Leicht et al., 2022). Such a perception is based on the inexistence of institutional requirements and incentives in teaching which are focused on sustainability. In Pakistan, Ahmad (2021) found that educators recognize the role of environmental education but they recognize the presence of several obstacles such as inflexible curricula, insufficient administrative patronage, and ineffective professional development courses. These issues have to be tackled through systemic institutional policies reforms that engage faculty throughout the curriculum design and implementation process.

Research Gaps and Rationales of the Study

Despite the international popularity of sustainability education, the current literature lacks empirical studies on how it can be contextualized to be practically implemented in the developing higher education systems. Three gaps have been identified in the literature.

To begin with, the majority of sustainability education studies are conducted in western or industrialized settings and provide minimal information about the problems of developing countries like Pakistan (Wals and Leicht, 2021; UNESCO, 2023). Second, the current Pakistani research literature reports the presence of environmental content mostly, but does not analyze the perceptions of teachers, institutional preparedness, and pedagogical approaches towards the integration of curricula (Hussain and Batool, 2022). Third, the literature on SDG-based curriculum frameworks and connection to local educational realities and innovations developed by teachers is limited.



These gaps are important to be addressed in line with the alignment of the national education change with the ESD 2030 vision. Hence, the current research is dedicated to the investigation of the perceptions of the teachers in terms of the opportunities, potential, and issues of environmental education integration in university programs. Such a focus does not only close a contextual gap in sustainability literature but also offers practical information to the curriculum developers and policymakers interested in fostering sustainability in higher education in Pakistan.

Research Methodology

Research Design

The design of the research study was a qualitative study in which the opinions, perceptions, and experiences of faculty members in universities towards application and implementation of environmental education in higher education level were to be explored and interpreted. It was concluded that the qualitative method would be the best tool to use in this investigation because the researcher has a chance to learn in-depth details about the lived experiences, attitudes, and practices of participants in their respective educational settings (Creswell, 2014). In such a way, it will be possible to analyze complex social phenomena in a holistic manner, especially how environmental education should be integrated into the curricula and what it means in terms of pedagogy.

The paper was divided into four thematic dimensions whereby: (i) faculty perceptions about the need and importance of environmental education at the university level; (ii) mechanisms and strategies of integrating environmental education into the curriculum; (iii) future challenges and potential opportunities; and (iv) remedies and future directions. These dimensions are interpretive, which is consistent with the epistemological presuppositions of the qualitative inquiry and, therefore, justifies the methodological decision.

The study was carried out in the University of Baltistan, Skardu where two academic departments participated in the study which included; the Department of Environmental Sciences and the Department of Educational Development. The selection of the participants was done by purposive sampling, whereby a total of six participants were picked, three per department.

These departments were chosen consciously. The representatives of the Environmental Sciences faculty have an expertise in the climatic and ecological processes in the regional setting, and the representatives of Educational Development one have an understanding of the process of pedagogical framework and curriculum development. Their views are combined to give a holistic view of the content aspect and teaching aspect of environmental education.

The use of six sample was deemed adequate based on the exploratory research design. When conducting qualitative inquiry, depth of data is the focus of the research instead of breadth (Patton, 2015). The participants were all important informants who could provide rich data that had a grounded conceptual background, hence data adequacy and conceptual saturation were achieved within the specific scope of the research. Semi-structured interviews and classroom observations were used as the instrument of data collection. The semi structured interview protocol comprised of open ended questions that are meant to help draw the views of the participants regarding environmental education and its pedagogical applicability as well as its implementation in institutions. This method is known to be an effective tool of involving participants in reflective dialogue, which helps the researcher to gain subtle insights on human experiences (Fontana and



Frey, 2000). In order to maintain the validity and reliability of the data collection instrument, the data collection instrument was subjected to review by the field experts through the interview guide. Depending on their advice, required adjustments were implemented. A pilot interview was then carried to determine the clarity and reliability of the questions and further refiner was made thereafter before the main data collection process started.

Data Analysis and Findings

The information gathered on the teachers has been discussed and summarized the vision of the teachers towards introduction of environmental education, first, the information was arranged and then the interview information was transcribed. The ideas were transformed to the themes after transcription. In the main themes. The themes have been critically analyzed and conclusions made.

Teachers Attitude towards Environmental Education.

The discussion shows that all the teachers involved have a clear and detailed knowledge about environmental education (EE). Their views, though differing in focus, are brought together in a number of values. First of all, EE is regarded as a field of study dealing with the investigation of the environment and the problematic correlation of humans and their nature. This is supported by the fact that it is a scientific and methodological discipline that tries to comprehend ecological transformations and come up with solutions. As an example, participant D described it as the science whose subject is the study of the environment as well as the study of what causes the change in the environment and the debate of what can be done in order to ensure that the environment is secure. Moreover, educational element is highly underlined and the attention is paid to the creation of awareness, responsibility, and informed action. This was one of the targets that were pointed out by participant A, who added that the primary objective of environmental education revolves around helping us become good caretakers of the environment. Finally, the collective opinion of the teachers represents the idea of EE as a complex means of spreading awareness, responsibility, and informed decision-making in order to solve the acute environmental issues.

The present awareness of student on environmental education.

The educators mostly indicated a good encouraging percentage of environmental awareness amongst the university students. They credited such awareness to different platforms, such as formal education, the modern media, and institutional activities. According to the participant B, he observed that awareness and interest of the students towards the subject of environmental issues is quite satisfactory as most of the students have learnt about environment in several science subjects citing academic curriculum to be the important source of information. In the meantime, Participant A noted opportunities of modern activism, claiming that nowadays a lot of students are active in environmental concerns, attending protests, campaigns, and sustainability campaigns on their campuses. Nonetheless, there were other participants that provided a more detailed perspective, stating that awareness is not uniform and may be influenced by other factors. Participant E concisely pointed to the fact that the awareness of a student is a factor of the structure of education and the institutional encouragement of the student meaning that the exposure of an individual to environmental concepts is highly determined by his or her particular academic and institutional situation.

Requirement of Incorporating Environmental Education.



The participants were in unison that there was a dire need of environmental education being incorporated into the university curriculum. The fundamental reason that was recognized was to attain sustainable development and to raise a generation of responsible citizens who can be able to deal with environmental issues. Participant A gave a general explanation where s/he stated that the need is creating awareness of the environment in our society, sustainable development, interdisciplinary approach, improving the skills of the student, Research innovations and a healthy environment. This point of view was shared by other people that concentrated on the special chance offered by universities to shape the young minds. Participant E said, since the university students fall within the age bracket where they would be joining the productive segment of the society very soon. So to prepare them this would be well. All the studies predominately agree that EE is fundamentally needed to conserve the natural resources, increase professional behavior towards the environment and eventually produce educated citizens who will be able to contribute towards a sustainable future.

Perception of Incorporating Environmental Education in University Curriculum by the participants.

The participants promoted the idea of a holistic, realistic, and interdisciplinary solution to the issue of integrating environmental education. Their proposals differed according to the academic backgrounds though the similarity was the fact that they all had the objective of going beyond theoretical teaching. Participants that were science-oriented advised integrating EE in particular science courses. Participant A has said that the HEC already incorporated environmental education in other subject such as Ecology, Taxonomy Environmental Education and Environmental Biology. Other people stressed a more imbued approach in all fields. Participant B explained his or her personal approach: "I incorporated the environmental education in my course in a different way. I provide various example relating to environment sometime during my class. Also, the participants emphasized the need of active, practical experiences. The techniques mentioned by participant D include Field trips and outdoor activities, Guest speakers and experts, Project-based learning, Use of technology and Community engagement. One similarity revealed was that there was need to have proper training of teachers to integrate successfully as confirmed by Participant E who mentioned: A teacher should be trained to instill the need of integrating with various subjects.

Topics of Environmental Education that were introduced in the curriculum.

The respondents confirmed the significance of introducing environmental issues in the curriculum, but they had different opinions concerning the integration process. This was a powerful standpoint according to which the ideas of the environment are directly connected with any discipline. Participant A agreed to this and said, the environment topics are necessary in curricula since environment is related to all the subject of the field of discipline. Others implied a specialized, formal one with Participant B proposing to implement the department of environment sciences in university. Others were interested in integration in a practical sense in terms of activities and events that make the material interesting and realistic. Participant C proposed tactics like clarifying the idea to students, showing them the world perspective, motivating students to perform practical assignments, creating a level playing field, organizing different activities of children, and organizing eco-development camps. One of the aspects that Participant D taught me was that special application of environmental education will differ among educational systems and institutions, so localization and context-specific approaches that teachers and policymakers create are necessary.



Teacher Preparation and PD.

The participants were aware that successful application of environmental education depends on sound teacher preparation and continuous professional development. One need recognized by them was the necessity to train and gain deeper content knowledge as well as specific EE-focused pedagogical skills. Participant E was very clear when she said that training should involve Integration strategies, concept of environmental education and various implementations at various levels. That is something that a teacher should be trained to do. Participant B supported this opinion, pointing at the existence of structures, stating that teachers could acquire trainings in the workshops connected with the environmental science or that there were numerous professional training centers operating all over the world where teachers could receive benefits. Participant D offered a broad range of possible developmental opportunities, such as: Workshops and Conferences, Online Courses, Webinars and Webcasts and Environmental Education Certification Programs. Nonetheless, the fact that Participant F stated that there are No programs to develop teachers implies that there is no correspondence between the identified need and the real provision of the corresponding assistance, which is an area that the institution could improve.

Pedagogical Moves and Strategies.

The educators focused on employing active and participatory and student-based pedagogical techniques to impart environmental concepts in a useful way. The general feeling against the standard lecture-based approaches was overwhelmingly in favor of those approaches that promoted the practical experience and critical thinking. Participant A defended the position of Presentation method, Project based and Activity based learning, whereas Participant D listed all the strategies at much length like Hands-on Experiences, Inquiry-Based Learning, Project-Based Learning, and [Outdoor Education]. The application of technology and practical connections was also considered crucial; Participant B proposed that teachers can resort to the use of videos to make students realize the significance of clean and nice atmosphere. The discussion was also identified as one of the most potent tools of higher education. Participant E confirmed that Discussion is the most effective in my experience particularly when dealing with university students. Talking to them, and inquiring their views and putting them to thought. These strategies are regarded as necessary in motivating students to be environmental literate and proactive caretakers.

Plans to Refer to Active Learning and Environmental Consciousness among Students.

As a way of making the students more active and more environmentally conscious, the participants suggested the use of immersive and participatory learning approaches that would link the learning to practical application. Often, project-based and activity-based learning have been mentioned as examples of effective learning. Participant A merely mentioned, Project based and competition-based activities, whereas Participant C made a case, that the Activity-based approach is suitable in instructing environmental studies. Participant D elaborated on this, and she suggested solutions such as Experiential Learning, Service-Learning, and Role-Playing and Simulations, to enable students to be the agents of positive change in their lives. Personal relevance of the content was also perceived to be important. Participant B recommended that educators ought to inform students about the outcomes of the environment in their personal lives to attract the interest of students. Once again, facilitated discussion strategy was advocated due to its stimulative nature of critical thinking. Participant E restated that the strategy of talking to students and asking their opinion and making them think is a very efficient one in the context of university level.

The Institutional Support and Collaboration



The teachers had a significant different perception of institutional support of integrating environmental education. A few also found strong support base and collaboration opportunities. Participant A indicated that it has partnered with Non-Government Organizations. YES there is many opportunities, such as WWF, IUCN, and WCS. Participant B mentioned the presence of such resources as the availability of the Moral, Motivational and Financial support and prospects of interdisciplinary collaboration or partnership with external organizations. Participant D listed in detail the possible institutional supports such as; Curriculum Guidelines and Standards, Professional Development Programs, [And] Funding Opportunities. However, the lack of such support was noted by other participants which means that there is an institutional imbalance. Participant F replied straight forwardly, saying there was no such support available whereas Participant E said it was dependent on institute. This ambivalent feedback shows that although there are structures of support, their applications are not universal and universal to all educators.

Challenges and Problems

The respondents found four major types of barriers to incorporating environmental education, which include financial, academic, teacher-related, and administrative. These were main obstacles that were significantly agreed upon. Both Participant A and Participant F mentioned specifically Financial, Academic, Teachers related and Administrative issues, combining which Participant A said that all the mentioned factors are required to incorporate environmental education. Participant B particularly singled out the issue of "Financial challenges" as a significant impediment. Nevertheless, a more positive and opposite perspective was presented by Participant E who believed that the degree of these challenges would be alleviated claiming that in case teachers are trained properly, then the issue would be reduced. One does not always need to have high budget integration, but quality of integration does. This implies that resources are an issue but strategic investment in teacher training and quality implementation might address some of such hurdles.

Discussion and Conclusion

The research study was done to explore the views of teachers in a university institution in Skardu on the inclusion of environmental education in the university curriculum. The general discourse is on the comprehension of their awareness, their strategies they support and the perceived obstacles in this process. The results show that there is a solid agreement on the role of the environmental education in the sustainable development, the pathways and obstacles to effective implementation of the environmental education are clearly identified. The study established that all the teachers involved had an effective and detailed knowledge on environmental education. They not only understood it as the study of nature, but as a multidisciplinary area that investigates the complex interplay between humans and their surrounding and is concerned with comprehending the ecosystem, determining the critical environmental challenges, and coming up with practical solutions. This perspective makes environmental education a scientific, systematic and solutions-oriented field that is important in establishing a sustainable society.

Also, there was a unanimous agreement among the participants that students enter university with the right level of awareness of environmental issues with proper ambiance. They explained this awareness through the background of having been taught in school; involvement of environmentally related activities in their school backgrounds, and through their various personal experiences. This background of knowledge is perceived to be a major resource that university level environmental education can be anchored on. The teachers too were quite unanimous in the necessity to implement this subject in the higher education curriculum and the main objective of



which was the realization of a sustainable development. They stressed the importance of environmental education in conserving nature, inculcating professional behavior towards the environment among the young people and bringing about responsible citizens.

Concerning the implementation, the range of strategies available to participants was rather rich; a shift to the methods other than the traditional lecture-based was actively encouraged. They stressed pedagogical methods based on active and experiential learning i.e. project-based learning, field surveys, real- world projects and clean-up campaigns. Team-based approaches such as brainstorming sessions, seminars, and the formation of student volunteer groups were also noted, and the application of technology and inviting specialists of environmental organizations. To make these strategies successful, stakeholders emphasized on committed resources such as laboratories and fields, certified staff, appropriate textbooks and manuals and above all, the complex of training programs offered to teachers in order to provide them with the required abilities and knowledge.

Perceptions in regards to institutional support were different. Others pointed at opportunities in terms of collaboration with NGOs such as WWF and IUCN, and institutional resources such as funding, administrative support, and special coordinators. Nevertheless, there were also great obstacles that were also drawn out. The main barriers mentioned are the financial constraints, pressure of academic work, teacher preparation and management problems. Although some of the participants said that they did not experience any significant issue, the general opinion is that the lack of resources and adequate training is a significant challenge that should be mitigated. To evaluate the learning of students, the participants recommended a combination of both traditional and modern approaches. This encompasses traditional methods such as tests and quizzes as well as more viable assessments such as project work, presentations and field work reports, which emphasize not only the knowledge but critical thinking and problem solving skills. The research concludes that educators in higher educational establishments in Skardu are quite familiar with the problems of the environment and they extensively understand the value of environmental education. They are shown to have a clear grasp of its principles and are devoted to the idea of its integration to help in promoting sustainable development. The extent of environmental consciousness among the students has been considered as being satisfactory and this will form a good basis towards more complex and practical learning in the university level.

The participants also lobbied together in favor of an interdisciplinary, practical and holistic approach to environmental education. This incorporates integration of environmental ideas into different academic disciplines and therefore transcending the separate courses to forming pervasive and holistic learning experience. It is always focused on practical, interactive pedagogy practices that help to raise responsible, environment-aware, and active human beings. Although certain courses to be included in the process had minor differences depending on the teachers who were mostly science majors who suggested courses such as Ecology and Environmental Biology, and the social scientists who focused on field trips and seminars, the overall objective was the same. In the end, the study concludes that effective implementation of environmental education depends on addressing the major obstacles, the first one being insufficient funding and the second one is the necessity to train a large number of teachers. This demands a reinforced institutional backing, specialised professional development agenda, and institution-wide teamwork to inculcate the concept of sustainability into the beats of the university curriculum.

It has been concluded that the teachers are very much informed about their environment. They are also aware of the causes of climate change and the strategies of overcoming the causes and effect



of climate change. Participant A told that in their school, they already have environmental lessons in other classes. This implies that they are attempting to educate on the environment in a plethora of subjects including science which he also indicates some topics such as Ecology, Taxonomy, Environmental Education and Environmental Biology to teach environmental education. Participant B discusses the way they teach about the environment in their own classroom. They provide examples on the environment in their lessons and provide assignments pertaining to the environment. In his view Basic environmental Science course is appropriate to include environmental education. Participant C claimed that they discuss plants and their contribution towards the environment. They put emphasis on the role of plants in ensuring that ecosystems are healthy. And in addition of this environmental education he indicates adherence to subjects i.e.; ecology, biology, chemistry, geology, meteorology, anthropology, sociology, economics, and engineering are some of the subjects that are involved in the body of environmental science in totality. Participant D indicated that they can teach a lot about the environment in different ways. They take students on field trips and bring experts to speak, undertake projects, technology and engage the community. Combination of environmental education he proposes science and geography since Environmental science perfectly suits delving into ecological ideas, biodiversity, climate change, pollution, and sustainability and Geography is an excellent way of comprehending the interactions between the environment and human actions. In response to his point A, participant E responded that to teach environmental education, we make the connection between our subject and the practical life based on his argument.

The overall responses of the participants are based on the need to have a holistic and practical approach to environmental education. The idea to integrate environmental concepts in subjects and the practical experiences and training of teachers appears to be a good approach to getting environmentally conscious and responsible citizens. The particular techniques and topics could change, but the purpose thereof will always be the same, promoting a better interpretation of environmental concerns and their role in many spheres of life. Participants A, B, C and D are of science background hence they have depth knowledge on environmental changes and they recommend science subjects to be used to include environmental education in the university curricula. Although participant E and F belong to social science hence they propose field trips, seminars and conferences to integration of environmental education in university curriculum.

Recommendations

For teachers, it is recommended that they engage in continuous professional development to enhance their knowledge of environmental issues and their pedagogical skills for teaching them. They should move beyond traditional methods by actively incorporating a diverse range of strategies, including project-based learning, community projects, and technology-based multimedia presentations. Furthermore, teachers should strive to act as role models by leading and participating in student-led environmental initiatives and volunteer groups to inspire engagement and creativity.

For institutions and curriculum developers, it is imperative to proactively update and modify curricula to reflect global environmental concerns and the principles of sustainable development, ensuring environmental education is integrated across multiple disciplines. Institutions must invest in robust and ongoing teacher training programs, including workshops and peer observation, to



properly empower faculty. Providing dedicated institutional support in the form of adequate funding, resources like labs and field equipment, and appointed coordinators is essential. Finally, fostering partnerships with environmental NGOs, government bodies, and community organizations will provide invaluable real-world learning experiences for students and help ground academic knowledge in practical challenges.

For broader stakeholders, including NGOs and policy makers, it is recommended to actively collaborate with universities to provide expertise, resources, and opportunities for involvement in larger environmental projects. Supporting policy development that mandates and funds the integration of environmental education and sustainability principles across all levels of higher education is crucial for creating a large-scale and lasting impact.

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