ISSN Online: 3006-4708
ISSN Print: 3006-4694

SOCIAL SCIENCE REVIEW ARCHIVES
https://policyjournalofms.com

Developing a Sustainability Evaluation Framework for Higher Education Institutions: A Case Study Integrating Sustainable Development Goals in Pakistan

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DOI: https://doi.org/10.70670/sra.v3i3.1052

Abstract

By their education, research, and institutional practices, Higher Education Institutions (HEIs) contribute significantly to sustainable development. Though many HEIs in the world have centers and programs for sustainability, their efforts are often fragmented and not integrated across all areas of operation. Sustainability evaluation in Pakistani HEIs is in its nascent stages, with no standardized framework aligned with the Sustainable Development Goals (SDGs). Through modification of the Sustainability Assessment Questionnaire (SAQ) and matching its dimensions—curriculum, operations, outreach, and governance with the relevant SDGs, this study aims to measure the sustainability performance of Pakistani higher education institutions (HEIs). By employing a mixed-methods design involving a literature review, expert opinions, and pilot survey, and making use of the Analytical Hierarchy Process (AHP) in assigning weights to key indicators and computing sustainability scores, the study aims to contribute to the assessment of the sustainability performance of Pakistani HEIs. Though curriculum and research fare moderately well, the evidence reflects significant gaps within outreach, student engagement, and administration. The findings highlight the need for comprehensive, SDG-congruent frameworks to support higher education institutions in systematically improving their sustainability policies. This research forms the foundation for future scholarly and policy discussions and contributes to the body of knowledge of institutional sustainability in developing countries.

Introduction

Higher Education Institutions (HEIs) have been advocating for sustainable development in higher education for many years. As per research conducted by (Soini, et al., 2018), numerous institutes are setting up sustainability centers to prove their commitment to solving sustainability issues. Still, a study done by Lozano et al. conveys that HEIs often struggle to implement sustainable development effectively, often working in individual sectors and never having a comprehensive approach. This adds to the challenges that HEI managers face in an attempt to integrate sustainability into their operations, such as institutional culture and availability of resources.

HEIs are instrumental in molding future decision-makers in different disciplines, making it important to integrate sustainability into their pedagogy. Vila et al. that the operations of the campus need to be conceptualized as an ongoing research process. Integrating Sustainable Development Goals (SDGs) in HEIs has several advantages, such as new partnerships and funding opportunities. The SDSN recommends five measures to boost the involvement of universities with the SDGs: encouraging skill development, evaluating current action, setting priorities, mainstreaming SDGs into strategy, and tracking action. HEIs play a vital role in promoting sustainability in society due to their potential to generate and disseminate knowledge (Loewe & Rippin, 2015).

HEIs and SDGs

Higher Education Institutions (HEIs) are able to integrate the objectives of sustainable development (SDGs) with ease, playing a critical role in education and research (El-Jardali, Ataya, & Fadlallah, 2018). As critical stakeholders in the SDGs, HEIs should focus research and outreach activities towards sustainable development. (Leal Filho et al., 2018). HEI rankings, such as the Times Higher Education, grade HEIs on the basis of SDG-related publications. The SDGs offer HEIs a chance to reformulate strategies and interact with governments and societies. Breaking down the compound nature of the SDGs through education, innovation, and leadership is necessary for society. HEIs stand to gain from embracing SDGs by quantifying their footprint, accessing funds, and forming partnerships, hence becoming globally conscious and accountable institutions (Sterling, Warwick, & Wyness, 2015). Sustainable Development Solutions Network focuses on HEIs' role in supporting the SDGs through teaching, research, governance, culture, and leadership.

Research Gap:

Despite growing awareness, institutes of higher education in Pakistan (HEIs) still have a glaring lack of evaluation of sustainability concepts. The necessity for appropriate assessment instruments pertaining to Sustainable Development Goals (SDGs) is emphasized by the well-known statement made by Peter Drucker, "What gets measured, gets managed." Very less attention has been paid to the sustainability assessment tools, even some research has been done on sustainability in HEIs but not specifically on the assessment tools. For example, Bukhari et al. (2023) discovered that academic leaders are not very interested in getting stakeholders involved in learning about sustainability. They mostly concentrated on management while ignoring other critical factors. Tariq et al. observed that green programs have a beneficial impact on students' attitudes toward environmental issues. Kalsoom et al. (Kalsoom & Qureshi, 2021) emphasized that teacher’s lack information about sustainable development. Habib et al. brought attention towards this important aspect in HEIs. A all-inclusive charter that incorporates diverse elements of sustainability and engages important players like teachers, students, companies, and the community is necessary.

Objective of the study:

To develop and apply a sustainability evaluation framework for HEIs incorporating SDGs

Literature Review

Overview of the Higher Education Institution (HEI) present status of sustainability performance and initiatives

Between 1999 and 2009, Talloires Declaration signatories collaborated with the University Leaders association for a Sustainable Future to develop and refine the Questionnaire for Assessment of Sustainability (SAQ). This quantitative tool is envisioned to measure the sustainability initiatives within colleges and universities in seven major areas: education and syllabus, exploration, campus operations, community and public involvement, faculty development, governance/administration,

and student participation. Its primary goal is to bring awareness and considerate sustainable development, spark debate on how sustainability affects higher education, and provide direction for upcoming sustainability efforts at higher education institutions (HEIs).

Despite advances in sustainability assessment tools, there is criticism that many frameworks focus too narrowly on specific areas and rely heavily on economic data or eco-efficiency. Recent tools have become more complex, adding various categories for evaluation, but often lack clear justifications for their methods and can be inflexible. A need exists for a comprehensive, integrated framework that incorporates essential aspects of sustainability in campus management, governance, and community involvement, emphasizing stakeholder input (Wals, 2014).

Because of its strengths in encouraging sustainable practices and fostering dialogue, the SAQ will serve as the foundation for creating an evaluation framework that can be applied to Pakistan. But it might be difficult for bigger organizations to answer its extensive and thorough queries. As a result, the questions on the SAQ will be modified to better reflect the Goals (SDGs) to improve assessment. The seven dimensions of the SAQ are Curriculum, Research and Scholarship, Operations, Faculty & Staff Development & rewards, Outreach and Service; Student Opportunities; and Institutional Mission, Structure, and Planning (Shriberg, 2002).

Review of Sustainability Assessment Tools (SATs)

To enhance sustainability at higher education institutions, assessing and evaluating sustainability is essential. To implement the sustainable practices within HEIs, sustainability assessment is mandatory. A solid framework for these assessments is crucial for developing sustainable higher education institutes. Various tools for the assessment of sustainability like STAR, SAQ, AISHE, STAUNCH, GASU and AUA are used across the world. These tools offer effective methods for understanding sustainability, but many focus narrowly on economic aspects or eco-efficiency, making them less applicable or too complex for HEIs.

In developing countries like Pakistan, the use of SATs is limited, with most studies conducted in developed nations like United Kingdom, Australia, United States of America and Germany. In Pakistan, the context for sustainability assessment is still emerging, even as the number of recognized HEIs rises—currently around 195 according to the Higher Education Commission (HEC). The HEIs in Pakistan face many challenges in implementing Sustainable Development (SD) goals, and while the HEC launched green initiatives in 15 HEIs in 2018, there remains a significant gap in assessing sustainability related to SDGs (Unesco, 2015).

Research indicates a lack of commitment from HEI leadership toward sustainability, and gaps exist in understanding various SD dimensions, leading to inadequate stakeholder involvement. Studies show that there is little holistic assessment of sustainability in Pakistani HEIs, with most assessments relying on simple surveys rather than sophisticated SATs. Overall, a comprehensive and integrated framework that includes diverse aspects of sustainability and engages key stakeholders is needed to enhance practices of sustainable development in the HEIs within Pakistan.

Role of SDGs in institutional sustainability

Institutions are essential in influencing behavior at different levels, including the local, national, regional, and worldwide. They have an impact on key social groups and are successful at maintaining order, addressing societal concerns, encouraging economic development, and preserving environmental equilibrium. The numerous definitions of sustainable universities highlight different features. A sustainable campus is defined by Alshuwaikhat and Abubakar as a healthy environment that fosters resource conservation, social justice and waste reduction while also having a robust economy (Alshuwaikhat & Abubakar, 2008). The responsibilities of a sustainable campus to improve the health of people and ecosystems, which includes involving the university community in addressing social and environmental issues, which are the main focus of Cole et al. (Cole, 2003).

According to Velazquez et al. (Velazquez, Munguia, Platt, & Taddei, 2006), a sustainable institute is one that carries out its responsibilities in teaching, research, and outreach while minimizing its negative effects. Although these definitions mostly center on social, economic, and environmental factors, they ignore governance, education, public awareness, and stakeholder participation. By focusing on social inclusion, poverty reduction, economic growth, good governance, peace and sustainable environment by 2030, the UN is prioritizing sustainability to address global challenges.

Relevance of the Sustainability Assessment Questionnaire (SAQ)

The (SAQ) is a useful instrument to assess HIEs for sustainability. The SAQ, initially developed and enhanced by the Talloires Declaration from 1999 to 2009, with the University Leaders Association for a Sustainable Future Development as a collaborator, was supposed to support endorsement of awareness, discussion, and institutional analysis of sustainable action. It offers an in-depth evaluation of seven essential areas of sustainability performance: curriculum, research and scholarship, operations, faculty and staff development, outreach and service, student involvement, and planning and administration. It is highly useful for initiating strategic planning and institutional transformation due to its qualitative and flexible nature. SAQ remains a popular and flexible tool, although it has come under criticism due to its length and the open-ended format of its questions, which can be challenging to administer for large organizations (Shriberg, 2002). SAQ offers a practical and flexible template in the Pakistani context, where sustainability auditing in HEIs is in its infancy. Its application can be enhanced by linking its dimensions directly to the (SDGs) so that it responds to both local institutional requirements and global sustainability commitments simultaneously.

Research Methodology

This section explains different methods of data collection for research. This section attempts to provide an overview of general research procedures and the methodology applied in this study. Data collection is crucial in responding to research questions and testing results. Data can be gathered in two primary ways: primary and secondary. Data that is original and collected for the first time is referred to as primary data, and most of the time for data collection is spent using it.

Qualitative research centers around collecting data to know attitudes and experiences. It utilizes methods such as interviews and observations and is useful in topics such as sociology. Utilizing statistics to analyze survey and experiment data, quantitative research works with numerical data to identify patterns and test hypotheses.

Mixed-methods studies merge both qualitative and quantitative methods. The strategy is better in that it merges the strengths of both approaches while counteracting the weaknesses, resulting in a more holistic understanding of the issue. Generally, the research adopted a mixed approach to arrive at its findings.

Research Design:

Methodological strategy employed in order to establish a strategic assessment framework for the long-term sustainability of HEIs:

Step-1: Review of the literature

A critical review of existing literature was conducted, for seven key areas of the Sustainability Assessment Questionnaire (SAQ) previously discussed. The review examined the specific indicators associated with each dimension and their individual impact on enhancing the sustainability of HEIs.

Step-2: Linkage with SDGs

Every significant dimension of the SAQ was systematically linked with united Nation`s SDGs in the

following stage. Every SAQ question was measured at the indicator level against relevant SDG targets, making it possible to map systematic sustainability principles onto global goals. This process provided the foundation upon which to develop sustainability recommendations. There are two components to the SAQ instrument: one captures demographic information regarding the respondents, and the second addresses the SAQ dimensions, further divided into seven thematic subcategories.

SAQ Dimension	Relevant SDGs	Key Targets / Strategic Objectives
1. Curriculum	SDG 4 – Quality Education	- Make sure that everyone has justifiable access quality education in low cost. - Making skilful nation for better jobs and placement. - No gender biasedness and aid disadvantaged students. – Bringing peace, promoting education, caring for human rights and gender equality and sustainable development.
2. Research & Scholarship	SDG 9, SDG 2, SDG 3, SDG 7, SDG 12, SDG 14, SDG 17	- Foster investment in R&D and expand the number of researchers, especially in developing nations. - Foster industrial diversification and technology growth. - Foster research in responsible production, vaccines, and eco-friendly agriculture. - Enhance access to science, technology, and innovation through equitable partnerships.
3. Operations	SDG 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12	- establish guidelines for safe handling of dangerous materials. - implement policies of gender equality and equitable pay. - ensure there are comprehensive health and well-being services. - promote the integration of disadvantaged groups. - eliminate violence against women. - provide campus food that is sustainable, locally sourced. - provide targeted financial assistance for students from low-income groups. - integrate environmentally sustainable design into infrastructure. - Develop emission-free policies and renewable energy. - Develop climate action plans with risk integration. - Engage the campus community in sustainability activities. - Adopt innovative, eco-friendly processes.
4. Faculty & Staff Development	SDG 4, SDG 8, SDG 10, SDG 16	- minimize wage gaps. - Enforce ethical procurement without forced labor. - Ensure that the campus is safe. - Align training, hiring, and policy to ensure equity.
5. Outreach & Service	SDG 11, SDG 17	- Encourage enduring international collaborations. - Work together to create eco-friendly routes for bikes and sustainable transportation.
6. Student Opportunities	SDG 4, SDG 8, SDG 16	- Maintain campus safety for everyone. - Make sure students, faculty, and staff participate in governance.
7. Administration, Mission & Planning	SDG 4, SDG 8, SDG 10, SDG 16	- Increase accessibility for underprivileged communities. - Keep an eye on workload distribution and employment outcomes. - Use ethical procurement procedures. - Make sure people are aware of their rights and have access to justice.

Step 3: Questionnaire testing

To determine if respondents comprehended the questions and were able to give correct answers, the questionnaire was tested using cognitive interviews. Important parties from Higher Education Institutions (HEIs), such as students, faculty, and administrative personnel, made up the respondents. From the interviews it was found that most of the people had no idea about the sustainability in HEIs in Pakistan because it was not being taught in many schools. At the outset of the survey, there should be a clear definition of sustainability along with straightforward descriptions of important concepts. For the sake of clarity, some sentences were simplified since they were hard to grasp.

Step 4: Applying the Analytical Hierarchy Process

The Sustainability Assessment Questionnaire uses AHP to measure the significance of seven major areas. The study had two main goals: finding out the stakeholders priorities and determining the imprint for a system that tracks and assesses sustainability. To determine these weights, each individual's opinion was taken into account separately.

Before employing AHP, the issue was divided into a hierarchy of criteria to make comparison easier. By allowing decision-makers to compare alternatives in a methodical manner according to each criterion, this helps them make better choices. Qualitative comparisons are converted into numerical values by AHP, making analysis simpler.

The statistical likelihood for value was then computed once the relative weights of each criteria had been determined after all comparisons. The likelihood of a choice achieving the desired outcomes is reflected in this probability; the higher the probability, the greater the likelihood of success.

Step 5: Data collection

A pilot survey was conducted to test a new questionnaire aimed at stakeholders in Higher Education Institutions (HEIs). After improving the questionnaire, a plan was created to collect information using both printed questionnaires and Google Forms. The benefits of using these two methods are outlined. The questionnaire was easier for participants since many preferred paper surveys over online forms. The data from paper surveys was later entered into IBM SPSS for analysis. Google Forms made it easy to keep track of responses, as they were quickly retrieved and uploaded for analysis.

Sampling technique and size

The survey requires a sample size based on calculations. The study involves 200 members of higher education institutions (HEIs), with a questionnaire sent to them. We need to determine the correct sample size using a formula based on random sampling. The total population for our study is 415. A population represents a group related to a specific inquiry, which can include real or fictional items. Typically, it refers to individuals, like workers in a company or students at a university. The margin of error is set at 5%, indicating how much the sample results could differ from the whole population, with a 95% confidence level. We distributed 200 questionnaires and received 100 responses.

Results and Discussion

Curriculum

Curriculum includes courses focused on sustainability in institutes of higher education (HEIs). The current sustainability score is 15. 52, below the expected score of 24. 1, indicating a need for improvement. HEIs must enhance their curriculum to meet sustainability goals, as outlined in the Curriculum Framework for the SDGs. This framework supports the 2030 Agenda and emphasizes the importance of a relevant curriculum to help students understand and address environmental and societal challenges.

Operations
HEIs include sustainability practices into their operations and curriculum, such as waste reduction and energy conservation. The sustainability score for HEIs in Pakistan is low at 14. 24, below the expected 26. 6. Actions needed include upgrading HVAC systems, improving hostel insulation, installing water-saving fixtures, recycling waste, promoting public transport, creating a bike-pedestrian system, and following new environmental building standards.

Faculty and Staff Development
Promotion, tenure, and hiring support teachers' sustainability efforts. Low-revenue HEIs can foster sustainable leadership through conferences and certification programs for faculty. The data shows a sustainability score of 4. 95, lower than the expected 9. 9, indicating average faculty development in Pakistan's HEIs.

Outreach and services
Outreach and services in higher education institutions aim to support local communities sustainably. Collaboration across various sectors is necessary for this. HEIs plays an important role in attaining the SDGs but show a low sustainability score of 5. 6 compared to the expected 12. 3. This indicates a need for improvement in promoting sustainability in Pakistani HEIs.

Student engagements
Student engagement in environmental efforts is low, scoring 5. 63 against an expected 10. 3. More programs are needed in Pakistan's higher education institutions.

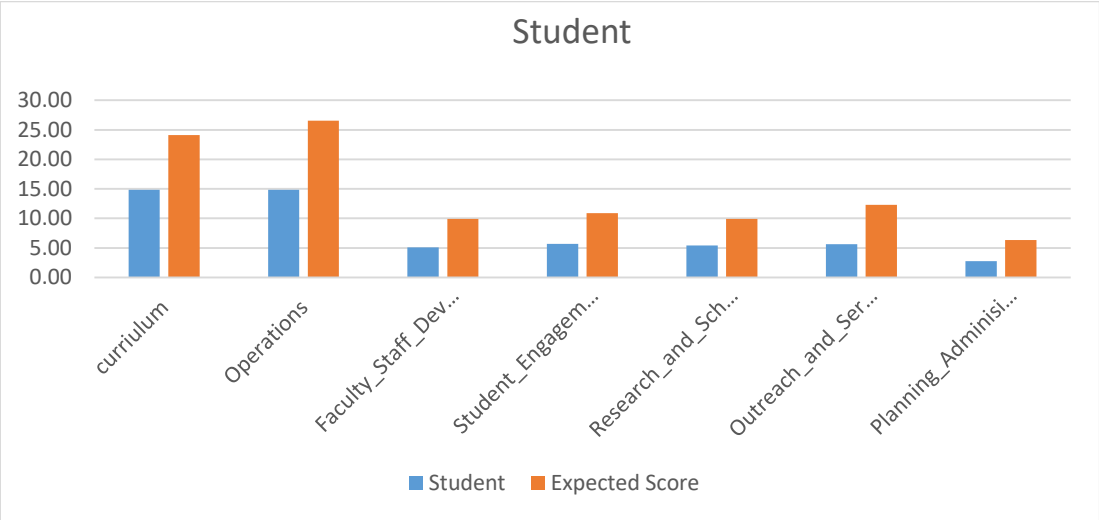
Research and scholarship
The text discusses sustainability research in Institutes of higher education (HEIs) and highlights the need for improvement. HEIs share information and score 5. 5 in sustainability, below the expected 9. 9. There's a need to enhance sustainability efforts to meet quality education goals and HEIs can succeed in sustainability without dedicated funding or staff through their academic programs.

Planning and Administration
HEIs should have clear mission statements about sustainability and support from committees. Current sustainability scores in Pakistan are low, indicating a need for improvement. Implementing SDGs can benefit HEIs. This involves identifying the need for SDG education, securing fresh financing, and establishing partnerships. The difficulties associated with the SDGs have sparked talks about institutes of higher education and their sustainability. In 2018, the HEC launched environmental projects at 15 schools.

Stakeholders are used to determine the Sustainability score.
The three stakeholder groups engaged in this study are:
1. Students
2. Instructing Staff - faculty
3. Management Personnel

Students
The Sustainability Score with respect to Students measures their attitudes toward sustainability within their higher education institution. Using the AHP method, which weights or prioritizes at each HEI, it compares their real ratings of different sustainability indicators with the anticipated scores, which

are determined.

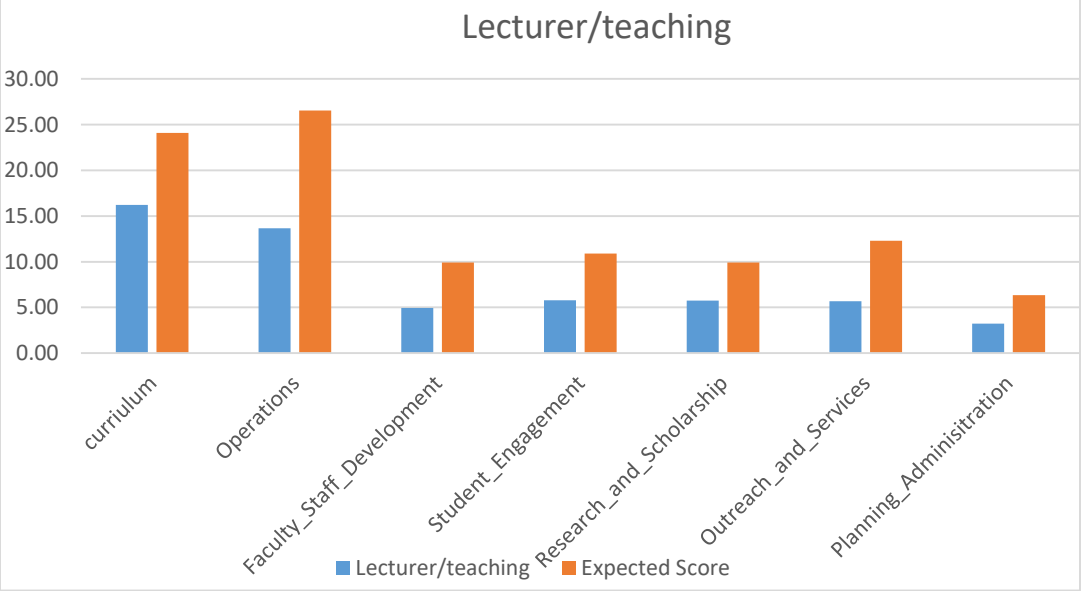


Sustainability Rating in relation to Students

The overall sustainability score of 54.37 is highly correlated with the sustainability score of HEIs. Thus, implying that the community where students live has no impact on sustainability.

Teachers

The sustainability score for instructors or lecturers reflects how each higher education institution views institutional sustainability. To highlight areas where staff views are in line with (or at odds with) institutional priorities, it compares their actual ratings of sustainability indicators with expected scores, which were computed using weights derived from AHP.

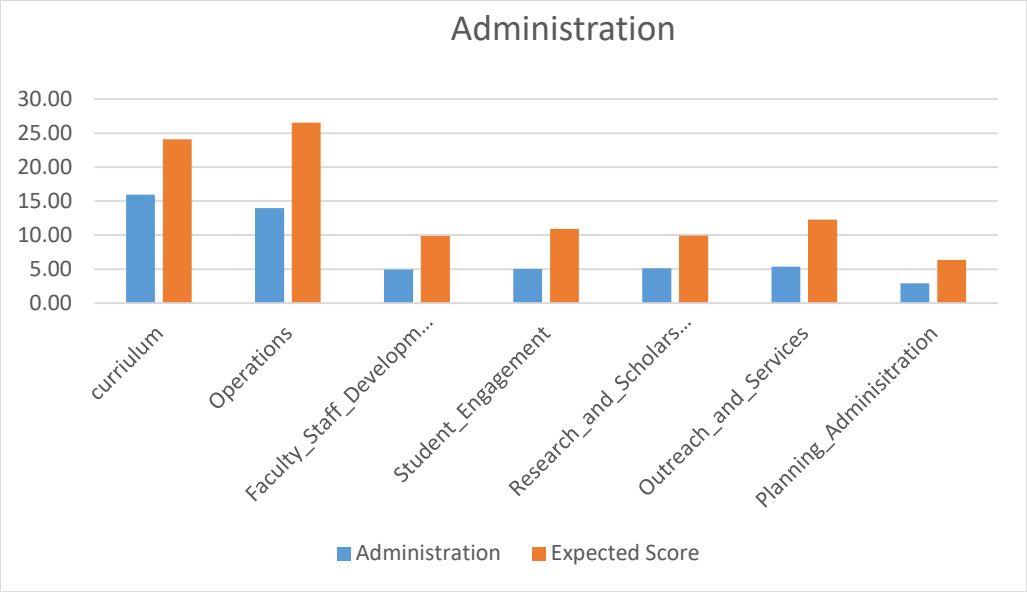


The Sustainability Score for Teaching Staff

The Total Sustainability Score (S.S.) is 55.22, which is comparable to the total sustainability mark of HEIs. As a result, there are no differences in sustainability when it comes to teaching personnel.

Administrative staff

The administrative staff sustainability score reflects how institutional sustainability is seen by the administrative staff at each HEI. In each HEI, we compared the real sustainability scores for each indicator with the predicted scores, which were determined using the AHP method's weighting or prioritization.



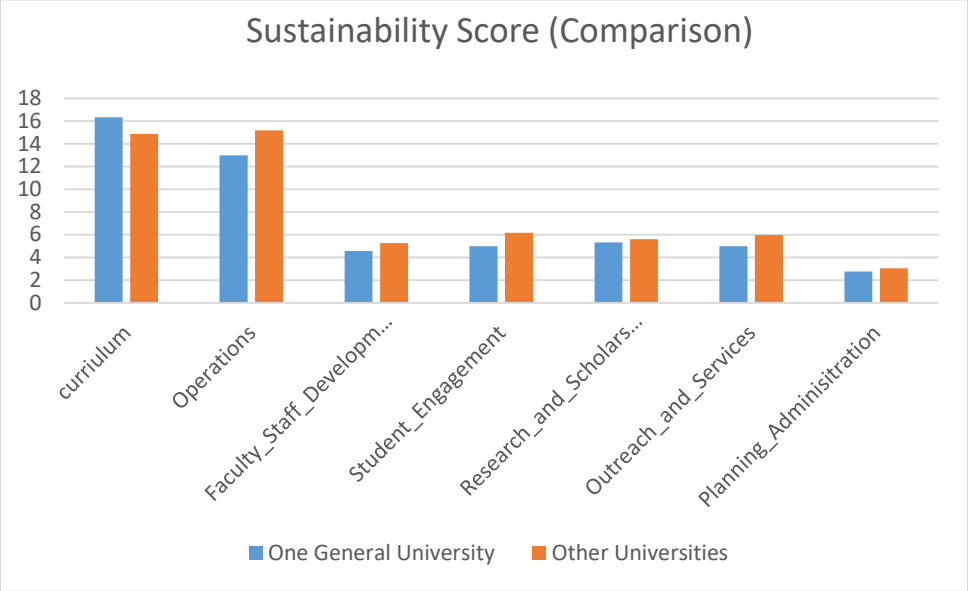
Administration (Sustainability Score)

The overall sustainability score (S.S.) is 53.34, which is comparable to the sustainability mark of higher education institutions. Therefore, when it comes to administrative personnel, sustainability is not a factor.

Sustainability ranking comparison among higher education institutions

Its indicators of one university are compared with those of other universities using its sustainability score on the graph.

The overall score for one general HEI is 51.94, whereas the overall score for another HEI is 54.37. When compared to the calculated expected value of 100, the sustainability is found to be average, and one general university in Pakistan has a lower sustainability score than other higher education institutions.



Comparing the sustainability scores of a typical university with that of other higher education institutions

Conclusion

To aid in achieving SDGs, HEIs must evaluate their performance. This study examines how well Pakistan's HEIs are supported in monitoring these indicators and how they relate to current sustainability indicators. According to the study, sustainability initiatives in Pakistani HEIs are still in their infancy, with poor performance in areas like outreach, student participation, and administration. However, a few domains, such as Curriculum and Research, are doing a little bit better. In every aspect of sustainability, particularly in the areas where progress is lacking, improvements are necessary.

Future Work

This study assesses the sustainability of HEIs in Pakistan and helps discuss sustainability assessment. Further work will refine this concept using comparisons and surveys. The study should also expand to schools and colleges.

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