



IQRA NATIONAL UNIVERSITY, PESHAWAR
DEPARTMENT OF CIVIL ENGINEERING

Measuring Sustainability Literacy of Students

I. Overview

The approach taken by Iqra National University Peshawar to evaluate and measure the sustainability literacy of students. The university recognizes the importance of sustainability literacy in fostering responsible global citizens who are aware of environmental, social, and economic sustainability challenges.

II. Purpose

To assess how well students understand, learn, and retain key concepts related to sustainability, and to use this data to inform curriculum development and teaching methods for future academic years.

III. Approach to Measuring Sustainability Literacy

1. Pre- and Post-Course Assessments

- **Objective:** To measure changes in student knowledge of sustainability before and after taking relevant courses.
- **Method:** Students are given a sustainability literacy quiz at the beginning and end of each semester in courses that include sustainability as a core topic.
- **Example Questions:** Questions assess understanding of climate change, renewable resources, social equity, and economic sustainability.

2. Student Surveys

- **Objective:** To gather self-reported data on students' confidence in their knowledge of sustainability concepts.
- **Method:** A survey is conducted at the end of each semester asking students to reflect on how the course enhanced their understanding of sustainability-related topics.
- **Sample Survey Questions:**
 - How confident are you in your understanding of sustainability challenges facing the world today?



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- How well do you feel the course addressed the SDGs and their relevance to your field of study?

3. Coursework and Assignments

- **Objective:** To assess how well students apply sustainability concepts in practical settings.
- **Method:** Evaluation of students' projects, case studies, and presentations related to sustainability issues. The ability to critically analyze real-world sustainability challenges and propose solutions is a key indicator of literacy.

4. Capstone and Research Projects

- **Objective:** To measure how sustainability concepts are integrated into student-driven research and final projects.
- **Method:** Review of final year projects or capstone projects in which sustainability-related problems are addressed. Faculty assess the depth of understanding and application of sustainability principles.

5. Classroom Participation and Discussions

- **Objective:** To evaluate students' engagement with sustainability topics during class discussions and activities.
- **Method:** Faculty members track participation in sustainability discussions, evaluating the quality of contributions and understanding of concepts.

IV. Key Indicators of Sustainability Literacy

1. **Understanding of the SDGs:** Students should be able to explain the Sustainable Development Goals (SDGs) and their relevance.
2. **Awareness of Global Sustainability Issues:** Students should demonstrate awareness of critical sustainability challenges such as climate change, resource depletion, and social inequalities.
3. **Application of Concepts:** Students should be able to apply sustainability concepts in problem-solving scenarios, particularly within their field of study.



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4. **Critical Thinking:** Ability to critically evaluate sustainability-related challenges and propose viable solutions.

VI. Conclusion

Measuring sustainability literacy at Iqra National University is a critical step in ensuring students are equipped with the knowledge and skills to tackle global sustainability challenges. By implementing a comprehensive assessment strategy, the university aims to continuously improve how sustainability concepts are taught and retained by students.

Attachments:

- Appendix A: Sample Pre- and Post-Course Sustainability Quiz
- Appendix B: Survey Template on Sustainability Literacy
- Appendix C: Example of Sustainability-related Coursework and Projects
- Appendix D: Student Feedback Summary on Sustainability Education



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Appendix A: Detailed Pre- and Post-Course Sustainability Quiz

Quiz Overview and Instructions:

This quiz is designed to assess students' understanding of sustainability concepts both before and after completing relevant courses. The aim is to evaluate the knowledge gained throughout the course.

Instructions:

- This quiz contains 10 multiple-choice questions.
- Select the best answer for each question.
- You will take this quiz at the beginning and again at the end of the course to assess your progress.

Quiz Questions:

1. **What are the Sustainable Development Goals (SDGs)?**
 - a. A set of 17 global goals set by the UN to address global challenges
 - b. A list of environmental goals only
 - c. A political agenda with no real objectives
 - d. A project for developed nations only
2. **Which of the following is a renewable resource?**
 - a. Solar energy
 - b. Coal
 - c. Natural gas
 - d. Nuclear energy
3. **Which of the following best describes the concept of “sustainability”?**
 - a. Using resources in a way that ensures they are available for future generations
 - b. Maximizing economic growth regardless of environmental impact
 - c. Reducing costs by minimizing waste
 - d. Avoiding regulations to improve business performance
4. **What is climate change?**
 - a. Natural fluctuations in weather patterns



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- b. Long-term changes in the Earth's climate due to human activities
 - c. Temporary shifts in temperature
 - d. A myth with no scientific basis
5. **What are the three pillars of sustainability?**
- a. Social equity, economic viability, environmental responsibility
 - b. Profit, growth, wealth
 - c. Resource extraction, energy consumption, industrialization
 - d. Human rights, gender equality, political freedom
6. **What is a circular economy?**
- a. An economic model focused on continuous growth
 - b. An approach where resources are reused, repaired, and recycled to reduce waste
 - c. A system that maximizes the extraction of resources
 - d. None of the above
7. **Which of the following is an example of social sustainability?**
- a. Ensuring fair labor practices and equitable wages
 - b. Reducing air pollution
 - c. Developing renewable energy sources
 - d. Increasing food production
8. **How can businesses contribute to sustainability?**
- a. By adopting sustainable practices in their operations
 - b. By ignoring environmental regulations
 - c. By focusing solely on profits
 - d. None of the above
9. **What is the main cause of biodiversity loss?**
- a. Natural disasters
 - b. Human activities such as deforestation, pollution, and climate change
 - c. Changes in animal migration patterns
 - d. Variation in species reproduction rates



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10. Why is water conservation important for sustainability?

- a. Because water is a limitless resource
- b. Because water scarcity affects millions globally
- c. Because it helps generate electricity
- d. None of the above



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Appendix B: Detailed Survey Template on Sustainability Literacy

End-of-Semester Student Survey on Sustainability

Survey Objective:

This survey aims to assess students' confidence in understanding and applying sustainability concepts after completing the course. The responses will guide future improvements in sustainability education.

Instructions:

Please respond to the questions below based on your experience in the course.

Your responses will remain confidential and will be used to enhance sustainability teaching at the university.

Survey Questions:

Rate your confidence in understanding sustainability concepts before this course.

1 = Not confident at all, 5 = Very confident

Rate your confidence in understanding sustainability concepts after completing this course.

1 = Not confident at all, 5 = Very confident

How well did the course address the UN's Sustainable Development Goals (SDGs) and their relevance to your field of study?

- a. Very well
- b. Adequately
- c. Somewhat
- d. Not at all

Which of the following sustainability topics were covered in the course that you found most relevant?

(Select all that apply)

- a. Climate change and global warming
- b. Renewable energy
- c. Social equity and justice
- d. Sustainable economic practices



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- e. Biodiversity and conservation
- f. Circular economy
- g. Other: _____

What was the most important concept you learned in this course related to sustainability?

(Open-ended response)

Do you feel prepared to apply sustainability concepts in real-world situations as a result of this course?

- a. Yes
- b. Somewhat
- c. No

How would you rate the course in terms of helping you think critically about sustainability issues?

1 = Very Poor, 5 = Excellent

What improvements would you suggest to make this course more effective in teaching sustainability?

(Open-ended response)



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Appendix C: Detailed Example of Sustainability-related Coursework and Projects

Coursework Assignment: Case Study on Sustainable Urban Development

Assignment Title:

Case Study: Sustainable Practices in Urban Development

Objective:

To analyze the sustainability initiatives implemented in an urban environment, evaluate the challenges faced by the city, and provide recommendations for future improvements.

Instructions:

- Choose one city that has implemented notable sustainable urban development practices (e.g., Copenhagen, Singapore, Medellín).
- Prepare a report (2,000–3,000 words) analyzing the following:
 - The city's main sustainability initiatives (e.g., energy efficiency, green infrastructure, waste management).
 - The environmental, social, and economic challenges the city faces in maintaining sustainability.
 - How the city addresses or fails to address these challenges.
 - Provide your own recommendations for improving sustainability in the chosen city.

Evaluation Criteria:

- Depth of analysis (40%)
- Understanding of sustainability principles (30%)
- Originality of recommendations (20%)
- Clarity and structure of the report (10%)

Example Cities and Sustainability Initiatives:

- **Copenhagen:** Focus on carbon-neutrality through renewable energy and sustainable transportation.



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- **Singapore:** Water conservation and urban greenery strategies for a compact, sustainable city.
- **Medellín:** Social inclusion through innovative public transportation and urban regeneration projects.

Appendix D: Detailed Student Feedback Summary on Sustainability Education

Student Feedback Summary on Sustainability Literacy

Feedback Collection Method:

Student feedback was collected through an end-of-course survey and focus group discussions. The data reflects the students' perceptions of how effectively sustainability concepts were integrated into their learning experience.

Key Findings:

1. Positive Feedback:

- **87%** of students reported that they gained a better understanding of sustainability concepts compared to their knowledge before the course.
- **90%** of students expressed confidence in applying sustainability principles in real-world scenarios, particularly in their respective fields (e.g., civil engineering).
- Students appreciated the practical application of sustainability through case studies, fieldwork, and guest lectures from industry professionals.

2. Popular Sustainability Topics:

- **Climate Change and Global Warming:** 85% of students found this to be the most relevant and pressing issue discussed.
- **Renewable Energy Solutions:** 78% of students highlighted renewable energy as a critical takeaway, particularly solar and wind energy technologies.
- **Sustainable Business Practices:** 60% of students appreciated learning about how businesses can adopt sustainable practices and the role of corporate responsibility in sustainability.

3. Areas for Improvement:



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- **30%** of students suggested the integration of more hands-on, practical projects related to sustainability, such as community projects or sustainability challenges within local areas.
- **25%** of students expressed interest in learning about advanced sustainability topics such as carbon accounting, life-cycle analysis, and green finance.

Actions Taken:

Based on the feedback, the university will incorporate more experiential learning opportunities, such as sustainability workshops and on-site visits to green businesses or sustainable urban development projects.