



Assessing the Effectiveness of Outcome-Based Education in Achieving Sustainable Development Goals

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Abstract. Sustainable development is increasingly influencing the way higher education is changing around the world. Universities need to find new ways of improving educational outcomes while also supporting global sustainability efforts. A key framework for creating better quality and relevant and accessible higher education is to focus on learning outcomes as a basis for defining what students should learn and how to assess their learning. The purpose of this study was to review the evidence regarding the effectiveness of outcome-based education as a means of achieving the Sustainable Development Goals through the implementation of outcome-based education in higher education institutions.

This is a study that used a quantitative approach and surveyed 200 participants (students and faculty) from specific colleges and universities. Data was collected by using a questionnaire and analyzed using various statistical methods, including descriptive statistics, reliability tests, factor analysis, and regression analysis. It was found that the implementation of Outcome-Based Education has a strong positive influence on sustainability-focused learning outcomes. The implementation of Outcome-Based Education improves students' critical thinking, problem-solving abilities, and social responsibility, and curriculum alignment, innovative teaching methods, and institutional support are essential to improve the effectiveness of In conclusion, the successful application of outcome-based educational methodology can support the development of key competencies for sustainability, which are consistent with the United Nations' worldwide agenda. Higher education institutions can make a significant contribution to the creation of responsible graduates who are equipped to respond to societal and environmental issues through the alignment of education strategies with sustainability objectives. This research provides important recommendations for policymakers, educators, and institutions of higher education who wish to improve the quality of their education and promote the development of a sustainable society

Keywords: Outcome-Based Education, Sustainable Development Goals, Higher Education Quality Assurance, Sustainability Competencies, Outcome-Based

Learning, Educational Innovation, Student Learning Outcomes, Sustainable Higher Education.

1 Introduction

Global challenges are being met through the contribution of higher education institutions by creating an educated, skilled, and value-based workforce that can contribute to sustainable development. Recently, more universities have been changing their academic structures to align with the global agenda that has emerged through the United Nations as part of the Sustainable Development Goals (SDGs). Education is a major part of the SDGs; however, there are other areas focused on equity and economic development as well as providing the necessary environment for future generations as part of human development. To help achieve these global goals, higher education institutions need to implement innovative strategies to enhance their teaching and learning methodologies, which will lead to measurable learning outcomes and practical solutions to complex problems. One type of innovative strategy being used in higher education is Outcome-Based Education (OBE) where universities provide clearly defined learning outcomes along with competency-based assessments that align curriculum, teaching styles, and assessment processes.

The use of Outcome-Based Education is a significant way to enhance quality and relevance in higher education, in addition to supporting the achievement of SDG 4, Quality Education. This means providing all individuals with equitable and inclusive access to a quality education. The application of skills such as critical thinking, creative problem-solving, and social responsibility to resolve real-world sustainability issues, is made possible through the incorporation of OBE into higher education curricula. While OBE is increasing in use among colleges and universities, we still need to examine how well these types of educational practices contribute to advancing the broader Sustainable Development Goals. Evaluating the effectiveness of OBE as it relates to providing sustainability-related learning outcomes is critical to improving quality assurance systems, and therefore enhancing the role of colleges and universities in establishing sustainability.

1.1 Statement of the Problem

More and more universities are expected to contribute to the sustainability of global society through the alignment of their educational offerings with the goals of the United Nations by utilizing Sustainable Development Goals (SDG). To meet these global mandates, many institutions have created an Outcome-Based Education (OBE) framework to support improvement in educational outcomes quality, relevance, and accountability. OBE emphasizes establishing clearly defined learning outcomes for students and using competency-based assessments and student-centered instructional methods to achieve enhanced outcomes, particularly in terms of employability, critical thinking, and problem-solving abilities. While there is growing evidence that OBE is being adopted by universities across the globe, there remains uncertainty about how successful these

educational practices will be in supporting sustainability-oriented educational outcomes and contributing positively to broader global sustainability objectives.

Despite many universities asserting to integrate sustainability concepts into their curriculum, there is little clarity on the resulting alignment between the implemented practices of outcome based education (OBE) and their success in achieving sustainable development goals (SDGs). The numerous issues that impede many universities from successfully implementing OBE include insufficient faculty understanding of sustainability education, deficient integration of the curriculum, lack of measurable indicators and inadequate mechanisms for measuring the effect of OBE on developing sustainable development competencies of students. Consequently, it is necessary to thoroughly investigate if OBE does indeed provide students with knowledge, skills, and attitudes that foster sustainability. Accordingly, this study will explore how effective OBE is in achieving the SDGs at higher education institutions, as well as identify factors related to the successful implementation of OBE.

1.2 Objectives of the Study

1. To explore how Outcome Based Education has been implemented across higher education institutions.
2. To investigate the connection between Outcome Based Education and assisting to accomplish the Sustainable Development Goals in higher education.
3. To assess the efficacy of Outcome Based Education in encouraging sustainability based knowledge, skills, and may also competencies amongst students.
4. To determine what challenges and opportunities exist for aligning Outcome Based Education with the goals of the United Nations sustainability agenda

1.3 Research Methodology

A research approach follows quantitative methodology to assess whether outcome-based education contributes to achieving sustainable development goals at the tertiary level. The descriptive and explanatory research will be used in this purpose and will focus on the way that students and instructors perceive the impact of outcome-based education with respect to sustainability oriented outcomes. In order to gather primary data, researchers will utilize a standardized questionnaire distributed to respondents at participating higher education institutions.

A total of 200 samples (both students and faculty) form the basis for data collection through convenience sampling. A variety of analyses were performed to satisfy the criteria of an academic-level analysis, including descriptive statistics, reliability analysis (using Cronbach's Alpha), factor analysis, and multiple regression analysis, which revealed the relationship between the practice of outcome-based education and developing sustainability competencies. The analysis also included hypothesis testing to determine whether or not the relationships between the variables studied were statistically significant. Data will also include secondary data collected from peer-reviewed journals, scholarly publications, institutional reports, and international policy documents related to sustainable development and higher education, including various United Nations documents and reports. Using these different types of analyses provides a fuller understanding of the relationship between using outcome-based education and sustainable development in higher education institutions.

1.4 Limitation of the Study

The study is limited to 200 respondents from selected higher education institutions, which may not fully represent the perceptions and experiences of all stakeholders involved in the implementation of Outcome-Based Education. Therefore, the findings of the study may have limited generalizability when applied to a broader context of higher education institutions working toward achieving the Sustainable Development Goals.

2 Review of Literature

Mahrishi & al. (2025). The systematic review of global perspectives on Outcome-Based Education (OBE) as a tool for higher educational institutions to achieve the objectives of the Sustainable Development Goals (SDGs), as well as supporting students in developing competencies such as problem-solving, innovation, and critical thinking. The

study demonstrates that the use of OBE can help practitioners align their educational practices with sustainability principles (SDG) in support of accomplishing sustainable development—active learning, and project-based approaches should be utilized to improve the contributions that OBE makes to sustainable development.

Umar & al. (2024). Biblical Analysis of a decade's worth of data pertaining to sustainability research in higher education institutions reveals a rapid increase in sustainability performance and institutional accountability within universities. The results make it clear that HEIs are key to enabling students' competencies and creating a sustainability-oriented workforce. In addition, the authors stress the importance of incorporating sustainability into teaching, research, and governing. They also highlight that institutional strategic planning and innovative pedagogy are significant contributors to successful implementation of sustainable higher-education initiatives.

La Sunra, Nur Aeni, and Fauzan Hari Sudding Sally (2024). The principles and practices of Outcome-Based Education in current educational systems were analyzed by Sunra and colleagues, focusing particularly on the fact that OBE is a movement away from teacher-centered, traditional ways of learning to becoming student-centered with a focus on developing competencies. This research established the importance of aligning curriculum, strategies for assessing student learning, and measurable outcomes on enhancing educational quality. OBE is also meant to develop students' critical thinking and problem-solving skills. The authors conclude that institutional commitment and training of faculty members for effective OBE implementation are necessary.

Naniek Utami Handayani et al. (2024). The ways in which lecturers and students perceive the implementation of Outcome-based Education in universities were analyzed by Handayani and collaborators. Their findings demonstrate that OBE allows for development of students' learning competencies through emphasizing measurable outcomes and their engagement in the learning experience. In addition, they provide evidence that outcome-based instructional methods promote student collaboration, communication, and analytical thought. Handayani et al. also identified several challenges to a successful implementation of an OBE approach to learning, such as faculty not being aware of OBE, and faculty not having adequate assessment methodologies. The authors emphasized the need for institutions to support OBE implementation and to develop training programs for faculty who will be implementing OBE.

Mohamud Mohamed Hassan and Abd Rahman Ahmad (2025) conducted a systematic literature review of the sustainability practices of higher education institutions throughout the world. This review examined over 500 peer-reviewed publications and analysed common themes such as: governance; curriculum marketing; community engagement; and environmental responsibility. The results of this review indicated that the sustainability concepts of higher education institutions are becoming integrated into academic programs and institutional policies. Additionally, the authors stated that education that is focused on sustainability will help develop citizenship and long term environmental stewardship. Furthermore, this review also indicated that developing nations have gaps in the sustainability implementation process.

Shakira Irfana, et al. (2026) explored the ways in which educational institutions affect the sustainability attitudes and values of their students. The study concluded that educational institutions that provide students with a sustainability-oriented curriculum and

institutional initiatives are a major influence on promoting responsible behaviours. The researchers also concluded that the implementation of policy reforms that promote the development of outcome-based education frameworks also promote the adoption of sustainability-oriented behaviours by students. The authors asserted that it is important to include environmental education in future higher education systems. In addition, the results of this research indicate that educational institutions with a focus on sustainability can have a significant impact on the development of social and environmental sustainability over the long term by the students they produce.

Shraih, H. J., At all. (2026). The authors of this article looked at the development of e-learning and how it is being used to achieve quality management in institutions of higher education. This research article has demonstrated the impact that digital learning technology can have regarding educational quality and accessibility. In fact, the authors state that technology-enabled education will support new ways of teaching based on innovative methods of teaching, including outcome-based learning models. In addition, the authors explain that the existence of effective quality assurance (QA) systems is critical for assessing learning outcomes in digitally delivered education. Finally, the authors concluded that leveraging technology in combination with QA frameworks, institutions of higher education will enhance their overall performance.

3 Overview of the Study.

3.1 Theoretical Contribution

At the core of this study, is the belief that preparing students for life after school, is defined by the fundamental principles of outcome-based education (obe). Obe is an educational philosophy that focuses on clearly defined and measurable learning outcomes which also emphasises the importance of assessing student competencies using a variety of student-centred teaching approaches. The theoretical base for outcome-based education is that educational systems should place greater emphasis on the results of learning as defined by the student, than on what has been taught to them through inputs (example: course outline and/or syllabus).

Outcome-based education provides a framework for aligning the design of the curriculum, the instructional strategies employed in student education and the evaluative methods used to assess whether students have mastered a particular set of skills and knowledge identified in the learning outcomes of a program of study. By emphasizing measurable competencies such as critical thinking; problem-solving; teamworking etc. the outcome-based education framework is an attempt to raise the quality and relevance of post-secondary education through an emphasis on measuring student learning.

The theoretical framework for this study is supported by existing theories of sustainable education and aligned with UN Global Development Agenda – Sustainable Development Goals (SDGs). The theory of sustainable education uses a higher education institution as a medium to promote active and responsible citizenship, environmental awareness, and social and economic equity. Therefore, it is anticipated that universities will

incorporate sustainability into their curricula, research, and community service activities. The integration of outcome-based education (OBE) with sustainable education principles provides an opportunity for institutions to develop graduate attributes that include knowledge, values, and skills that will enable them to make a significant contribution to solving the major global problems and helping develop a sustainable future.

3.2 Conceptual Framework

Figure 1 - Conceptual Framework

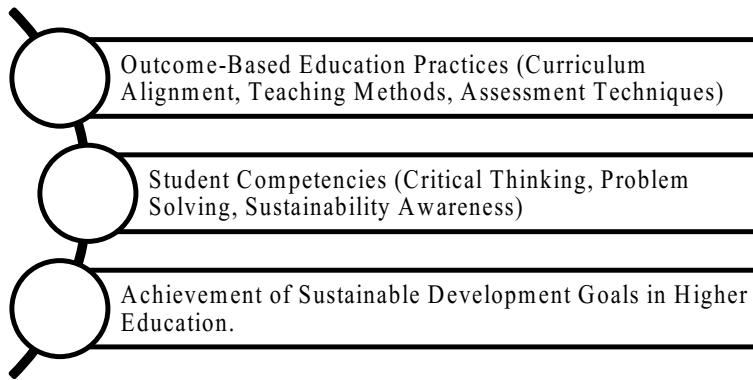


Figure 1 shows that This study's Conceptual Framework outlines how its research connects Outcome-Based Education (OBE) practices to the achievement of learning outcomes related to sustainability in a post-secondary context. The framework of this study suggests that the effective use of OBE will have a positive impact on the competencies, skills, and knowledge of students that relate to the achievement of sustainable development. According to this framework, curriculum alignment, student-centered pedagogies, continuous assessment, and competency-based assessments are identified as independent variables relative to OBE in relation to sustainability learning outcomes. As dependent variables, the achievement of sustainable development goals (SDGs) in higher education is investigated as they relate to developing students' knowledge/awareness of sustainability, critical thinking skills, problem-solving abilities, and sense of social responsibility. The framework further proposes that when OBE practices are implemented in conjunction with Sustainable Development concepts by post-secondary institutions, this results in improvements to educational quality and sustainable development. In summary, the Conceptual Framework of this study suggests that the successful application of OBE practices will result in students achieving enhanced sustainability-related learning outcomes and progress toward the global sustainable development agenda.

4 Data Analysis and Interpretation

Table 1 : Reliability Analysis

Variable	No. of Items	Cronbach's Alpha
Outcome-Based Education Practices	5	0.84
Sustainability Learning Outcomes	5	0.81
Overall Scale	10	0.83

Table 1 shown that To evaluate the internal consistency of the questionnaire items relating to Outcome-Based Education and Sustainable Learning Outcomes, a Reliability Analysis was carried out. The Cronbach's Alpha of .83 indicates good reliability for use as a measuring scale (with values greater than .70 being acceptable). This suggests that the items used in this questionnaire are internally consistent and can be used for additional statistical analyses related to the Sustainable Development Goals for Higher Education.

Table 2: Descriptive Statistics

Variable	Mean	Standard Deviation
Outcome-Based Education Implementation	3.82	0.71
Sustainability Competencies	3.76	0.68

Table 2 shows that The average outcome of the descriptive stats are 528 individual responses; the mean score on the assessment of outcome based education implementation (OBE) (in the respondents' perspective), is equal to 3.82. This implies there are a moderate to high number of OBE practices within the institution overall. The average score on the OBE assessment (sustainability competency), is equal to 3.76. This indicates a high implication from the respondents that there is some contribution made to sustainability awareness, critical thinking, and problem solving as a result of OBE.

Table 3: Factor Analysis

Factors	Factor Loading
Curriculum	0.78

Alignment	
Student-Centered Teaching	0.74
Continuous Assessment	0.71
Sustainability Awareness	0.76
Problem-Solving Skills	0.72

Table 3 shows that The purpose of this analysis was to identify the main contributors to the success of Outcome-Based Education by using factor analysis to gain insights into the key factors. The findings from factor analysis yield three high-factor-loading components that significantly contribute to developing sustainability competencies: curriculum alignment, student-centered teaching methods, and ongoing assessment. The identified factor loading values demonstrate that each of these components has high degrees of correlation with the underlying constructs (i.e., a factor loading value of >0.70).

Table 4: Multiple Regression Analysis

Independent Variable	Beta Value	t-Value	Significance (p)
OBE Implementation	0.65	9.12	0.000
Dependent Variable	R	R ²	
Sustainability Outcomes	0.72	0.52	

Table 4 shows that According to the results of our regression analysis, we found that implementing Outcome-Based Education has a meaningful impact on sustainability learning outcomes. The beta value of 0.65 indicates a positive relationship between the application of OBE practices and sustainability competencies. Additionally, the R² value of 0.52 indicates that approximately 52% of the variation in sustainability learning outcomes is attributable to the implementation of OBE practices in higher education institutions.

Table 5: Hypothesis Testing

Variables	Beta Coefficient	t-value	p-value	Result
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Outcome-Based Education → SDG Achieve- ment	0.65	9.12	0.000	Significant
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Table 5 shows that The table above shows how the hypothesis testing for regression analysis has been conducted. The p-value was found to be 0.000 which is lower than the significance level of 0.05 indicating there is a statistically significant relationship between Outcome-Based Education and achieving the Sustainable Development Goals in Higher Education. Hence, the null hypothesis (H0) was rejected and the alternative hypothesis (H1) was accepted supporting that implementing outcome-based education positively affects learning outcomes related to Sustainability

5 Findings of the Study

The research study's results show that the effectiveness and quality of higher education teaching and learning are greatly enhanced through the implementation of an Outcome-Based Education paradigm. Most of the participants in this study believe outcome-based education provides students with critical thinking, analytical ability, and problem-solving skills. The data collected for the study and the descriptive and reliability analyses show that respondents from higher education institutions perceive their institutions to have a relatively moderate to high degree of OBE practice. The factor analysis results also identified curriculum alignment, student-centered teaching methods, and continuous assessment as the primary elements contributing to the success of OBE. In addition, the results of the statistical analysis showed that there is a statistically significant correlation between implementing outcome-based education and developing student learning outcomes related to worldwide goals. Hypothesis testing confirmed that implementing OBE has a significant impact on developing learner awareness of sustainability, promoting social responsibility and critical thinking in learners. Findings also revealed that institutional resources, faculty involvement and effective curricular design are all critical to the successful integration of sustainability concepts in outcome-based education models at universities.

6 Suggestions

In order to effectively implement Outcome-Based Education (OBE), postsecondary institutions need to build clear lines of alignment between curriculum design, teaching practices and method of assessments. Adding sustainability-oriented content throughout each academic program will improve students' competencies in relation to critical thought, creativity and responsible decision-making. Additionally, it is critical that universities regularly review their curricular to ensure they are delivering learning outcomes that represent global priority items, particularly those associated with the United Nations Sustainable Development Goals. Besides, faculties are encouraged to invest

more into their faculty's continued education by developing and then continuing to support advanced pedagogical strategies and environmentally sustainable teaching practices. New approaches towards experiential learning, project-based learning, and interdisciplinary collaboration could all be adopted to increase the effectiveness of outcome-based education as well. Universities will also need complete monitoring and evaluation systems in place to evaluate how effective outcome-based education is for students developing the skills required for sustainability-related careers, as well as how well they succeed in achieving their sustainability-related goals. All of these institutional efforts would help improve educational quality as well as elevate how much higher education institutions contribute toward creating sustainable societies.

7 Discussion

This study shows how Outcome-Based Education (OBE) in Higher Education Systems is becoming essential for improving the relevance and quality of university programmes. In turn, OBE has significantly assisted students with developing identification and use of critical thinking, problem solving and analytical skills; all of which are quickly becoming necessary requirements for resolving today's increasingly complex global social, environmental and economic issues. The statistical analysis conducted in this study verifies that the implementation of OBE will produce positive outcomes that will assist in achieving more sustainable oriented educational outcomes. In addition, defined learning objectives and competency-based assessments are necessary components to improving higher education's overall effectiveness. The research findings indicate that universities can play an important role in contributing to global sustainability initiatives through an alignment of their educational activities with the Sustainable Development Goals defined by the UN. The incorporation of sustainability principles into OBE curriculums is essential in developing students' environmental awareness, social responsibility, and ethical decision-making skills; however, the successful implementation of OBE requires significant institutional support, ongoing faculty development, and appropriate curriculum development efforts. Universities must implement new teaching strategies and apply a holistic approach to quality standards in order to produce effective OBE and create graduates that can help contribute positively to society.

8 Conclusion

In order to investigate the effectiveness of Outcome-Based Education (OBE) in promoting sustainability-focused learning outcomes in higher-education institutions, this study captured the empirical evidence provided by the OBE implementation process. The findings indicate that through the consistent application of OBE practices, students develop many additional competencies, such as critical thought, analytical reasoning, and problem-solving ability. By focusing on explicitly defined, measureable, and competency-based learning outcomes and assessment methods, OBE contributes to enhancing the overall quality, accountability, and relevance of higher education. The empirical data analysed by the OBE implementation analysis reinforces a statistically significant,

positive relationship between the implementation of OBE and the promotion of sustainability-related competencies among students. The findings reaffirm the importance of higher education institutions in the global advancement of sustainability by coordinating academic practices with the United Nations' Sustainable Development Goals (SDGs). Universities can create graduates who are socially responsible and equipped to address various environmental, social, and economic challenges when they incorporate sustainability perspectives into outcomes-based curricula. Therefore, in order to maximise the impact of outcomes-based education (OBE) within higher education, there is a need to strengthen institutional frameworks, provide continuous faculty development, and implement innovative teaching strategies. The results of this study contribute to the growing body of literature related to sustainable education and quality assurance, providing practical implications for academic institutions and policymakers seeking to improve educational outcomes through the promotion of sustainable development.

References

1. Mahrishi, M., Ramakrishna, S., Hosseini, S., & Abbas, A. (2025). *A systematic literature review of the global trends of outcome-based education (OBE) in higher education with an SDG perspective related to engineering education*. *Discover Sustainability*, 6(1), 620, 1–21. <https://doi.org/10.1007/s43621-025-01496-z>
2. Umar, S. B., Ahmad, J., Bukhori, M. A. B. M., Mohd Ali, K. A., & Wan Hussain, W. M. H. (2024). *A decade in review: Bibliometric analysis of sustainable performance trends in higher education institutes*. *Frontiers in Education*, 9, Article 1433525. <https://doi.org/10.3389/educ.2024.1433525>
3. Sunra, L., Aeni, N., & Sally, F. H. S. (2024). A comprehensive exploration of outcome-based education principles and practices. *Asian Journal of Education and Social Studies*, 50(1), 1–9. <https://doi.org/10.9734/AJESS/2024/v50i11234>
4. Handayani, N. U., Wibowo, M. A., Christiani, S. D. K., & Ulkhaq, M. M. (2024). Implementation of outcome-based education from the perception of lecturers and students. *Journal of Education Technology*, 8(3), 472–483. <https://doi.org/10.23887/jet.v8i3.76621>
5. Hassan, M. M., & Ahmad, A. R. (2025). Systematic literature review on the sustainability of higher education institutions (HEIs): Dimensions, practices and research gaps. *Cogent Education*, 12(1). <https://doi.org/10.1080/2331186X.2025.2549789>
6. Irfana, S., Panakaje, N., Shali Lasrado, B., Parvin, S. M. R., Madhura, K., Raj, J., Shahid, M., Rashmi, H., Kulal, A., et al. (2026). Sustainability prioritization dynamics: How educational institutions shape student behavior through environmental values. *Humanities and Social Sciences Communications*, 13, Article 179. <https://doi.org/10.1057/s41599-025-06478-0>
7. Shraih, H. J. A., Santos-Roldán, L., Maldonado, M. A., & Moyano, M. (2026). *E-learning, quality management, and higher education in the UAE: Evolution and current landscape*. *Frontiers in Education*, 10, Article 1704646. <https://doi.org/10.3389/educ.2025.1704646>

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