Incorporating Training and Management for Institutional Sustainability: The Worldwide Implementation of Sustainable Development Goals

Dr. Ayad Alkaim[1*], Dr. Ahmmad Hassan[2]

[1*]*Faculty of Management, University of Tehran, Iran.*

[2]*Faculty of Management, University of Tehran, Iran.*

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Abstract

This study advances the attainment of the 17 Sustainable Development Goals (SDGs) via Education, an expanding research domain, using a thorough literature evaluation on Education and SDGs. One hundred sixty publications published in the last decade were acquired and analyzed. This enabled the identification of the foremost contributing and most significant authors, nations, publications, research outcomes, and contemporary research issues. This study offers a comprehensive understanding of the subject by (1) delineating six research categories and their prospective research trajectories and (2) presenting an approach to assist academic institutions in incorporating SDGs into their operations. The structure facilitates the integration of diverse stakeholder perspectives within the learning society to formulate an integrated plan for continual enhancement, execute it via action plans, and assess the outcomes.

Keywords: Sustainable Development Goals; Institutions; Management; Academic.

I. INTRODUCTION AND BACKGROUND

Sustainable Development (SD) is an ever-evolving subject that can instigate alterations in societal behavior, and organizations focus on reconciling the social, financial, and environmental facets of growth (Lowery et al., 2020). This issue has progressed markedly since the 1980s, and 2015 achieved considerable prominence with the publication of the 2030 Plan and Sustainable Development Goals (SDGs) (Pizzi et al., 2020).

The 2030 Strategy for SD, endorsed by politicians from 194 nations at the United Nations General Assembly (UNGA), delineates a novel global structure to steer humanity towards sustainability. It encompasses 18 goals, 170 objectives, and 230 metrics, proposing a comprehensive action plan for enhancing human welfare, fostering prosperity, and promoting harmony through collaborations across diverse sectors and countries. It is noted that several players, including governments, corporations, educational institutions, and grassroots organizations, play significant roles in the implementation of this Agenda, as guided by the UN. The college and university ecosystem plays a vital role for all involved parties.

Numerous studies underscore the significance of this industry for the SDG. Higher Educational Institutions (HEIs) are pivotal for SD through teaching, research, promotion, and management (Ribeiro et al., 2021). HEI is tasked with ensuring that citizens recognize their

responsible roles and equipping future workers with the skills and abilities necessary to address the issues of equitable growth.

Universities are advancing efforts to facilitate the execution of the 2030 Agenda. Organizations are formulating initiatives to achieve the SDGs. These impressions suggest that the roles and experiences of educational organizations might be structured as significant partners for financial, social, and environmental reform. These institutions must be motivated to synchronize their activities with the SDGs. The importance of universities in attaining SDGs is relatively recent. This aspect underscores the need to do research that delineates the involvement of these organizations in the issue.

The body of literature regarding SDGs at schools encompasses three studies using distinct forms of organization. The study proposes a thorough examination of the execution of the SDGs, concentrating solely on business schools (Weybrecht, 2022). The research comprehensively evaluated the research about SDGs and engineering institutions. The study conducted a bibliographic review of 875 papers, examining the integration of the SDGs in universities using a quantitative lens.

This article makes multiple contributions centered around the following foundations: (1) Identify the prominent journals and universities excelling in materials on the SDGs, taking into account the annual progression of these articles; (2) Understand the principal countries engaged in international discussions on the SDGs and the scope of case investigations (global, local, and nearby); (3) Highlight the design of previous investigations by categorizing the methodologies employed and their data collection tools; (4) Set up how organizations should integrate the SDGs across different facets of their operations, such as administration, pedagogy, studies, and communication; (5) Systematize strategies for implementing the SDGs in higher education institutions by evaluating efforts and obstacles.

This assessment provides institutions and academic groups with a framework for managing involvement with environmental sustainability (Leal Filho et al., 2021). This study is warranted as it enhances comprehension of how various research efforts engage with the SDGs and the 2030 Agenda. The current review examined the literature on equitable growth and cleaner manufacturing processes, highlighting the role of HEIs.

Sustainable production has been a topic of examination and a theme adopted by colleges for several reasons: (1) HEIs serve as beacons of knowledge regarding SD; (2) there is a lack of skilled workers in this field; (3) there is a need for the adaptation of cleaner methods within businesses and sectors; and (4) there are requirements to foster social and financial growth in a country through a more sustainable institutions paradigm that enhances environmental consciousness. The study demonstrated that novel innovations facilitate policy creation and optimize supply chains, industries, and individual enterprises to address the requirements of the contemporary economic landscape. This initial conversation necessitates a structure that fosters global efforts requiring academic discourse related to the SDGs and the field of science. Subsequent research will examine the idea of environmental responsibility among pupils, administrative personnel, and faculty within a university community (Anwar et al., 2020).

The study will examine the abilities acquired from an engineering degree regarding the SDGs. The paper addresses the research gap by discussing (1) the internal obstacles within HEIs and the inside and outside variables influencing the implementation procedure and (2) the integration of this topic into the strategic thinking of HEIs. This research presents fresh data on obstacles across six categories from both macro and micro viewpoint groups. The study subsequently delineates the primary elements influencing universities using an analytical framework concerning societal impacts.

II. MATERIALS AND METHODS

The systematic evaluation selected the knowledge of the field, adhering to an analysis protocol initiated by an inquiry, and followed the ordered process of article selection, gathering data, comprehension of their methodological characteristics, synthesis of the principal findings, composition, and release of the results of the analyses. A well-specified selection criterion enables future investigators to replicate the study.

The systemic review posits that it represents a more logical and less biased approach to organizing, analyzing, and synthesizing scientific information, serving as a helpful platform for knowledge dissemination. A systematic evaluation adheres to a defined process to impart coherence to an extensive body of literature.

The study utilized this technique to organize and systematize current research on the SDGs in higher education institutions, enabling an exhaustive examination that enhances the understanding of the subject and consolidates experiences related to the implementation of the SDGs across various HEIs (Serafini et al., 2022). Relevant papers on the subject were found through systematic and explicit search, assessment, and verification of studies accessible through chosen records, such as Science Direct, Scopus, and the Web of Science (WoS), as well as the published materials of the International Symposium on SD, the principal global occasion in the field.

Concerning the methodological procedure, additional studies were evaluated, offering directives for selecting the Preferred Research Items for Systematic Meta-Analysis (PRISMA): a framework designed to enhance the quality of organized reviews via an agenda encompassing various verification criteria (Parums, 2021). This process employs a mixture of keywords as a preliminary stage.

Particular criteria are employed for selecting, screening, qualifying, and incorporating research. HEI's perspectives on implementing the SDGs across several aspects of management, instruction, investigation, and communication were analyzed using these techniques. Empirical studies include several case studies, which are defined as comprehensive research on a particular topic, facilitating an in-depth understanding and providing a foundation for further inquiries on the same issue.

The selection of these studies is warranted since they are cited in interdisciplinary research tables, widely endorsed by scholars, and encompass high-impact publications across several fields. The symposium has been the preeminent event in the field, uniting papers on the SDGs since 2017.

2.1 Research Question

The primary question for selecting and analyzing research was developed by referencing prior studies, which provided a clear framework for enhancing literature assessment. The technique was established as a guide to formulating inquiry questions across many subjects and is frequently utilized in systematic examinations. The abbreviation pertains to P (individuals, issue, or community), I (action), C (comparing, oversight, or comparative), and O (results). The study query formulated: How are SDGs and the 2030 Plan integrated into HEIs globally? This inquiry aimed to ascertain the steps HEI undertakes to facilitate the realization of the SDGs. It commenced an examination of the knowledge that HEI is cultivating across various domains (instructing, studies, promotion, and administration), highlighting the pivotal role that universities play in fulfilling the goals and executing the 2030 Agenda in their oversight, faculty development, and in fostering awareness among college learners regarding these initiatives.

2.2 Research Strategies

Conferences were conducted with specialists to define the terms utilized in the search systems, alongside a review of prior research and a test phase. A query string was established to identify publications that have the phrases "Higher School" or "University" and " SDGs," "2030 Schedule," or "SDGs" in their positions, descriptions, and subtitles. This study yielded a total of 888 publications. The formulation of this string employed truncation characters in conjunction with Boolean operators, structured as follows: ("Higher School" OR College*) AND ("SDGs " OR "2030 Plan" OR SDGs). A multi-step elimination procedure, detailed below, yielded 48 papers for inclusion in this systematic examination. The article elucidates the role of HEIs in disseminating and integrating the SDGs, featuring instances focusing on using these standards in administration, pedagogy, research, and promotional efforts. This research facilitated the identification of measures to enhance sustainable engagement among educational institutions.

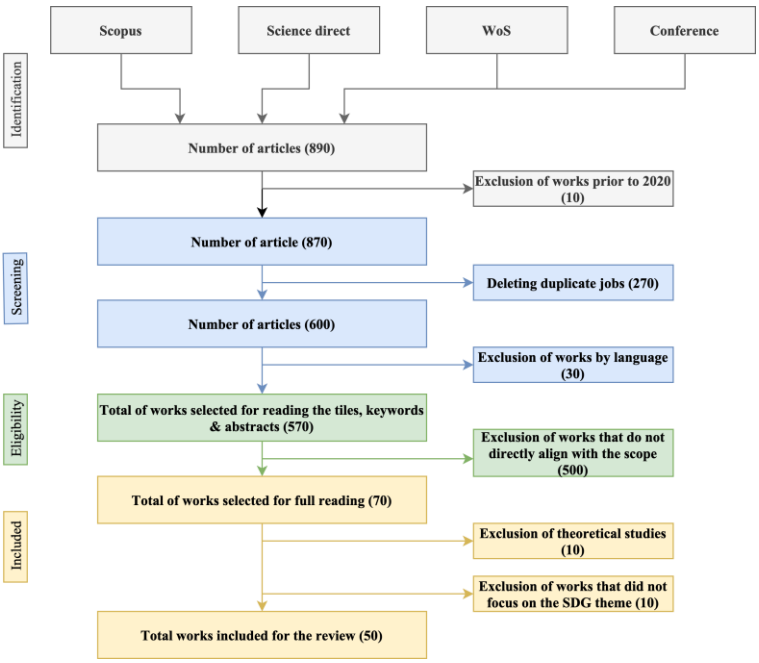

Figure 1: Research Workflow

Figure 1 depicts locating and choosing publications, adhering to the steps recommended by the PRISMA rules commonly utilized in this type of research.

- Literature inclusion and exclusion criteria

This stage entailed identifying the initial publications in research repositories. After outlining the utilized criteria and specified search phrases, the method yielded 890 publications categorized as open accessibility: 470 from the Scopus library, 385 from the WoS, 25 from the Science Direct database, and 18 from the sessions. A review step was necessary for the previously chosen publications, employing filters to enhance the viability of the research.

Papers submitted before 2020 were retracted. Since the inception of the 2030 Agenda this year, 12 articles have been eliminated, while 885 papers have gone into the subsequent phase. Following the first filtering, duplicate studies were eliminated from the comparisons of the databases, resulting in the exclusion of 300 duplicated papers, so the remaining 580 publications for analysis in the present study. A further screening phase was required: in the linguistic analysis, 15 publications not written in English, Portuguese, or Spanish were removed due to potential challenges in comprehensive reading and study. After applying these screening filtration systems, 570 articles were chosen to review titles, abstracts, and keywords, therefore commencing the eligibility step.

Eligibility entails excluding articles not aligning with the study subject when reviewing the abstracts and titles. Only publications aligned with the core purpose of this systematic review were selected to advance to the subsequent step. This method led to the elimination of 498 papers that, albeit including the keyword phrases, did not pertain to a specific instance of SDG application within higher education. These tasks were eliminated due to the following circumstances: (i) The phrase HEIs or related terminology was inadvertently incorporated during the abstract review. The evaluation revealed that the work did not tackle the pertinent theme; (ii) it did not reference the SDGs broadly, focusing solely on a single SDG, such as poverty, health, immigrants, or gender equality; (iii) it concentrated on an unrelated area, thus precluding a comprehensive contribution to the theme of SDGs within HEIs; or, ultimately, (iv) the investigation constituted an additional analysis (organized review or bibliometric investigation), that did not align with the research variables that necessitate the inclusion of only primary research.

The final stage in the present investigation was inclusion, commencing with the comprehensive review of 70 publications. During this phase, modifications were implemented to rectify mistakes and discrepancies in the database. They were standardizing the orthography of keywords. A comprehensive review of the publications was conducted, necessitating a meticulous examination to construct the summary of factors included in the study's findings. Several fresh studies were omitted from the final analysis due to their misalignment with the criteria for inclusion. Thirteen publications were determined to be omitted from the research core since they consist solely of conceptual research and do not present concrete experiences of higher education institutions with the SDGs.

Eleven other papers were omitted upon review since they did not concentrate on an experience related to the SDGs. Instead, they discussed equitable growth actions in a broader context,

rendering the suggested analyses in this study unfeasible. After these revised exclusions, an aggregate of 50 publications met the inclusion criteria throughout various phases and were deemed suitable for data gathering and assessment. Two academics separately conducted these chosen experiments to enhance the dependability and security of the method. Of the final selection of essays, thirty-six papers originate from the Scopus databases, four studies from the WoS databases, and five papers were sourced from the summit proceedings. It is essential that no articles from Science Direct were included, as the examination of duplicated research across each database revealed a substantial overlap of Scopus publications in both WoS and Science Direct. It was determined that a single record from this publication should be maintained, which is linked to the Scopus collection.

III. RESULTS AND DISCUSSIONS

Twenty-eight replies were obtained, forming the foundation for this evaluation. The replies came from all four continents and encompassed 25 distinct nations, as seen in the geographical distribution of respondents. The acquired numerical data were analyzed using descriptive statistics (mean and frequency) using IBM SPSS. The open-ended query was a critical component of the data gathered, and the answers were analyzed using content analysis about views on institutional emphasis on the execution of the 17 SDGs, from which many themes developed. Topics were categorized according to participants' perceptions of the organizational emphasis on SDG17 Partners for the Goals since SDG17 reporting is essential for involvement in the Times Higher Education (THE) Universities Impact Ratings.

The bulk of the replying higher education institutions were established between 2010 and 2020 (15), while some were formed between 1900 and 2000 (7) or after 2020 (5), resulting in a cohort predominantly comprised of relatively recent institutions. Only a single university was established before 1800. The group studied comprised public HEI (81.3%) and private HEI (23.2%). The overall student enrollment was well-distributed among all universities. Table 1 illustrates the overall number of pupils at each responding HEI.

Table 1: HEI Responders Analysis

No. of students	Rate	Percentage
< 5000	5	15.63
5000 to 10000	5	15.63
10000 to 20000	7	21.88
> 20000	15	46.88
Total	32	100

The initial quantitative inquiry concentrated on the level of awareness of the SDGs. Most replies revealed that colleges possess a significant level of consciousness, with 36% categorizing it as very high or high, 33% indicating a medium level, and 33% denoting an inadequate or shallow level of consciousness. Regarding the second numerical issue about the college's procedures that facilitate systematic engagement in achieving the SDGs, there is a diverse array of replies and a significant disparity in the institutional procedures. Each responder was permitted to select multiple practices. The majority of HEI have carried out an Approach (24.2%),

Action Plan (20.1%), Mission (23.4%), or Work Plan (25.2%). Participation in sustainability organizations is just 3.5%, despite the poll being sent to a sustainability-focused cohort. HEIs participate in many procedures and tasks, including teaching and financing schemes, yet these initiatives need more popularity. Merely 5.3% of participants reported that their colleges must participate in initiatives for the SDGs. Many participants selected one or two groups, indicating a limited impression of SDG achievement. The findings are shown in Table 2.

Table 2: SDG Analysis

Practices	**Rate**	**Percentage**
Strategies	13	17.11
Action plan	12	15.79
Policies	15	19.74
Work schedule	11	14.47
Membership in SD groups	3	3.95
Projects	2	2.63
Fundings	5	6.58
Meetings	3	3.95
Student initiatives	1	1.32
SD centre	4	5.26
Training	2	2.63
Awareness	5	6.58
Total	76	100

Regarding the third issue, which pertains to education, knowledge dissemination, and organizing notable events related to the SDGs, most replies were somewhat neutral (41.3%) and to a certain extent (41.5%), as seen in Table 3.

Table 3: SDG Event Analysis

HEI of specific SDG	**Rate**	**Percentage**
Great	4	11.11
Somewhat	15	41.67
Limited	15	41.67
Very limited	2	5.56
Total	36	100

The fourth inquiry delineated the present emphasis on the SDG within the university's operations. Answers were relatively evenly split; however, they were significantly biased towards negative comments, with 26.2% indicating low and 18.2% indicating extremely low. Table 4 presents these findings:

Table 4: Campus Operation Analysis

Campus operations of SDG	Rate	Percentage
Extreme	4	12.5
Higher	7	21.88
Medium	9	28.13
Lower	5	15.63
Poor	7	21.88
Total	32	100

The fifth query emphasized the significance of study, instruction, and dissemination of the SDGs. HEI prioritizes research significantly, with 15% rating it as "extremely high." All three categories, namely research (34.5%), education (45.2%), and outreach (38.2%), achieved scores below 50% in the top ranks, indicating that these areas remain in a nascent phase. Three of the four institutions with exceptionally high study scores exhibit high or very high scores for instructional and third-purpose activities. Of the eight colleges with a low study rating, seven exhibit an inadequate rating in the third mission and a low to moderate score in training. It indicates that institutions might undertake initiatives that collectively integrate these three areas to bolster conservation involvement. Table 5 presents the findings.

Table 5: SDG in HEI Analysis

Types	Extreme	Higher	Medium	Lower
Researches	15	19	38	28
Teaching	8	37	21	34
Extensions	12	22	25	41

IV. CONCLUSION

Following the 1992 Rio Summit, learning has been essential for SD. Nearly three decades later, Education for SD (ESD) is seen as an adjunct to conventional education, with specialized initiatives and a deficiency of a global perspective often dominating educational institutions.

This research presents a bibliographical examination of the study on institutions and SDGs published since 2015 to develop this field of knowledge further. A total of 115 documents were analyzed to ascertain the temporal evolution of the number of items on the list, the progression of citations produced by these publications, the publication frequency per writer, per nation, and per organization, the material of the ten most cited publications, the distribution of items across publications, the significance, effect, and prestige metrics for the ten publications with the highest publication counts, as well as the created and new study groups about the topic.

The bibliographical study has validated that examining existing research promotes future studies in this domain. The main finding is that the field requires further investigation and an increased volume of yearly releases. Despite a significant rise in publications over the past two years, the citation rates of the principal pieces remain low. Enhancing the relevance of the conducted study is essential, which might be accomplished by reading higher-impact journals. It

has been demonstrated that areas exhibiting higher productivity are Anglo-Saxon and European. The studies undertaken in three of the six indicated areas require enhancement, as most publications have emerged from the other three groupings: maturity frameworks, the integration of the SDGs, and instructional and pedagogical techniques.

Conversely, examining the current literature reveals the necessity to establish a framework to direct academic institutions in attaining the SDGs and fostering equitable growth. The structure addresses the necessity for guidelines that facilitate the worldwide transition toward sustainability in educational organizations. This tool is accessible to educational organizations aiming to enhance the implementation of the SDGs and foster sustainability within the school and the surrounding community.

It is crucial to emphasize the study's shortcomings. (1) the biases primarily constrained this research from examining only two bibliographic records: the WoS and Researchgate. A linguistic bias existed since these databases predominantly contained items published in English, while the query was only done in English. Alternative databases enhance and contrast the outcomes; (2) selecting particular keywords inherently generates additional bias. Alternative keywords have been included, potentially producing different outcomes; (3) a bibliometric evaluation was utilized for the literature study. Alternative techniques, including network analysis, are employed for this examination; (4) the research was categorized into six study clusters. Alternative approaches provide various categories.

The study differs from applying the model to educational organizations, resulting in instances that professionals could reference. Subsequent studies might examine the structure's adaptation in non-academic organizations to enhance stakeholder understanding of the SDGs and develop business plans together. Additional restrictions that have improved the outcomes include the exclusion of sections and publications from the sample, as well as the omission of the phrase 'sustainable' from the keywords. Future studies should focus on a more thorough analysis of the qualitative trends within each area.

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