Integration of Education for Sustainable Development (ESD) in Government College Curricula in Bangladesh

Mohammed Mijanur Rahaman[1], Yasmin Akter[2]

[1]Assistant Professor, Department of Accounting, Government City College, Chattogram (affiliated under National University, Bangladesh)

[2]Lecturer, Department of Accounting, Government Hazi Muhammad Mohsin College, Chattogram (affiliated under National University, Bangladesh)

DOI: https://dx.doi.org/10.47772/IJRISS.2025.903SEDU0719

Received: 21 November 2025; Accepted: 28 November 2025; Published: 04 December 2025

ABSTRACT

Background: The Sustainable Economic Development Goals focus on Education as a means of sustainability, and practically, there is not much information about the ESD practices in the government college sector in Bangladesh. This paper examines the integration of sustainability into the curricula, pedagogy, assessment, and co-curricular programs in such institutes.

Methods: A multiple case study design was qualitative in nature. Teachers, academic leaders, and students in the selected government colleges were interviewed (twelve) in depth. Thematic analysis was used to analyse the data, which included deductive codes based on ESD competency frameworks and inductive codes that developed during the interviews.

Results: The participants noted that the issues of sustainability are represented in multiple courses in a rather disorganized and not explicit way, and there is no coherent ESD framework or curriculum map. The textbooks were indicated as being descriptive and exam-oriented with little local case material or reference to SDG. Though lectures and note-taking prevail in pedagogy, some educators make use of projects, field observations, debates, and creative tasks in accordance with the principles of ESD. The evaluation is still centred on the use of written tests that focus on recall and there is little appreciation of ESD competencies. Co-curricular activities (e.g., environment and social welfare clubs) provide valuable but disjointed parallel spaces of ESD, which are not well connected to formal curricula. Moral encouragement, however, is not accompanied by policy, resources and staff training features institutional support. The students who were engaged in ESD-related activities exhibit enhanced awareness and slight behavioural change.

Conclusion: ESD in Bangladeshi state colleges is new yet weak. To have a whole-college approach to ESD, curriculum integration, competency-focused assessment, teacher professional development and the systematic linking of co-curricular activities to formal programmes are necessary.

Keywords: Education for Sustainable Development, curriculum, pedagogy, government colleges, Bangladesh, qualitative study.

INTRODUCTION

Education for Sustainable Development (ESD) has emerged as one of the pivotal approaches to reevaluating the approaches of societies educating their people to address current and future demands. ESD incorporates the ecological integrity, social justice, and economic well-being in learning processes, preparing learners to participate in sustainable futures at personal, professional, and civic levels (Dale and Newman, 2005); the notion was developed based on a wide-ranging sustainability debate that restructures development as a process that is dynamic and interdependent and necessitates disciplinary, sectoral, and generational knowledge, skills, and values (Dempsey et al., 2011). Researchers in the field of higher education and related post-secondary settings have contended that sustainable development cannot be the subject of study but rather a crosscutting, transformative goal within the curricula, pedagogy, and campus living (Yarime et al., 2012). ESD was then linked to the United Nations Sustainable Development Goals (SDGs), specifically SDG 4 (Quality Education)

and its target 4.7, which focuses on the need of education in sustainable development and global citizenship competencies (Chankseliani and McCowan, 2020). Cross-national studies underscore that universities play a central role in the development of knowledge, competencies, and social responsibility related to sustainability, which tend to be systemic institutional transformations and not unit-based courses (Chankseliani and McCowan, 2020; Yarime et al., 2012).

To make sure of the exact meaning of this study, the following definitions are taken. Sustainable development refers to a balance between three demands, namely environmental protection, social equity, and economic development, in such a way that current needs are satisfied without jeopardizing the needs of future generations (Dale & Newman, 2005). Education for Sustainable Development (ESD) refers to the interdisciplinary, experiential, and transformative process through which education helps learners to gain the knowledge, skills, values, and attitudes through which they can participate in sustainability transitions and address complex and real-world problems across the fields (Dale and Newman, 2005; Yarime et al., 2012). Government/tertiary college education. Government/tertiary college education educational institutions, mainly controlled or funded by the state, that award college diplomas and programs at the bachelor level are part of the larger national higher education system (Bennett et al., 2010; King et al., 2014).

It is necessary to have a brief perspective of international and regional policy frameworks that have a perspective on ESD. The wider SDG framework, especially SDG 4 and its target 4.7, influences national policies on education in favor of the inclusion of sustainability content and competencies in curriculum and testing, and continues to be the focus of the Education for Sustainable Development agenda in 2030 (Friedman et al., 2020). The academic summaries and policy-related research indicated that the transition to sustainability within the field of higher education expects not only the addition of courses but also institutional change, the involvement of stakeholders, and the development of new methods of teaching and evaluation that are not limited to the scope of disciplines (Celikdemir et al., 2017). Theoretical studies on sustainability in higher education emphasize deliberative governance, the necessity of working across disciplines, and the means of integrating ideas on sustainability into the areas of teaching and learning, learning resources, and campus operations (Carayannis et al., 2012). Literary research has highlighted that coherent strategy, professional growth in educators, and alignment between curricula, textbooks, and co-curricular activities (e.g., sustainability initiatives on the campus) are all that can be implemented to ensure success in effective integration (Savage et al., 2015; Beasy and Gale, 2020).

National education policies and curriculum reforms in the South Asian and Bangladeshi context have expressed ambitions of sustainability, although there is still a limited amount of empirical research on how ESD is handled in government college curricula. It is highlighted in the scholarly literature of the region that institutions of higher education can stimulate sustainability by matching policy, curriculum redesign, and campus-wide activities, but limited research on the dynamics of these processes exists in government colleges, as opposed to primary/secondary education or NGO activities (Chankseliani and McCowan, 2020; Yarime et al., 2012). Government colleges have a significant institutional presence in the post-secondary education system in Bangladesh: they are the significant point of entry to higher education among large groups of students being governed by ministerial systems and national quality assurance systems (King et al., 2014; Smith, 2011). However, the body of knowledge concerning the introduction of the themes of environmental, social, and economic sustainability into the material of the teaching process, teaching practices, textbooks, and extracurricular activities in Bangladeshi institutions of higher education is sparse and diffuse in its scope, casting doubt on the consistency of ESD integration in institutions (Savage et al., 2015; Bateh et al., 2014). These gaps correspond to larger findings in the higher education sector that sustainability integration is usually incomplete and disproportionate (Stough et al., 2018).

These gaps present an obvious gap in research. Higher education has demonstrated that the concepts of sustainability are still variably defined and operationalized; this comes with the debate on how integration can be measured and how to implement genuine inter- and transdisciplinary interaction instead of the add-ons (Stough et al., 2018). Regarding the Bangladeshi context, there is little empirical evidence of comparing the presence of ESD in government colleges with that of primary/secondary education and NGO-led programs, which restricts the policy advice on curricular reform and campus programs (Chankseliani and McCowan, 2020;

Yarime et al., 2012). Through filling this gap, the current research work adds to the body of literature on higher education sustainability around the world and the current context-specific policy and curricular discussions going on in Bangladesh.

General purpose and study objectives: The research paper examines the extent to which the theme of sustainability, namely environmental, social, and economic, is incorporated into teaching material, pedagogy, textbooks, and extracurricular activities in government colleges in Bangladesh.

LITERATURE REVIEW

ESD in higher education has become one of the primary ways through which university and college curricula can be adapted to the demands of sustainable development, which are quite complex. One of the most popular strands defines ESD as learning that prepares students with knowledge, skills, values, and perspectives to participate in a more sustainable society and incorporates the environmental, social, and economic aspects and links to the United Nations Sustainable Development Goals (SDGs) (e.g., per competencies, transformative learning, and integrative pedagogy) (Martin-Sanchez et al., 2022; Cebrian & Pubill, 2015; Wiek et al., 2011). The basic theory focuses on the view that ESD extends beyond the scope of discipline to encompass cross-cutting competencies and transformative learning experiences that enable graduates to respond to real-world sustainability challenges in a variety of professional and civic contexts (Vaniev & Malt-Cullen, 2024; Martin-Sanchez et al., 2022). By using competency frameworks, pedagogical models, and whole-institution strategies, this conceptual base has been put into practice in higher education with a view to entrenching sustainability in curricula, campus life, research, and community engagement (Martin-Sanchez et al., 2022; Cebrian & Pubill, 2015; Pittaway & Cope, 2007).

The world's conceptualizations of ESD in tertiary studies highlight both the scope of understanding and the importance of SDGs as a framework. The literature has a logical connection between ESD and essential sustainability competencies — that is, capabilities that allow graduates to think systemically, interdisciplinary, and reflectively and ethically achieve sustainability goals (Martin-Sanchez et al., 2022; Cebrian and Pubill, 2015). The SDGs offer a specific, results-based set of targets that have been utilized by universities to frame the program development, curriculum change, and assessment practices, without neglecting the current implementation gaps in most institutions (Cebrian & Pubill, 2015). One of the most striking syntheses observes that even with increased adoption, the discipline continues to grapple with the lack of a balanced integration between the disciplines, lack of development, and insufficient consistency between pedagogy and tangible sustainability results (Cebrian & Pubill, 2015). The integration of whole-institution conceptualization of what counts has been developed in the articulation of sustainability education theory to incorporate the alignment of curriculum, pedagogy, assessment, research, campus operations, and community engagement in a coherent way towards sustainability goals (Pittaway and Cope, 2007; Cebrian and Pubill, 2015).

Empirical Research sheds light on the integration of ESD in college and university programs throughout the world, with course content, pedagogy, assessment, and co-curricular activities. An approach that in fact is often used is cross-disciplinary integration of the SDGs into course design, as case studies have shown; SDG inventories, mapping activities, and integrative modules can bring interdisciplinarity and relevance to courses even outside the subject domain of one course (Chang & Lien, 2020; Cebrian & Pubill, 2015). Service-learning and learning by doing have emerged and gained more popularity as a method to bridge the gap between theory and real-world sustainability issues, as well as to build up professional competence; STEM and engineering courses often take a project-based or a learning-by-doing format to incorporate SDGs in curricula and evaluate sustainability-related outcomes (Abookire et al., 2020; Tarrant & Thiele, 2016; Wiek et al., 2011). Pedagogical innovation has been reported to be effective in promoting sustainability literacy and professional identity in graduates, both through active learning, reflective practice, and formats based on flipped or blended formats, as well as longitudinal and spiral curricula, which develop competencies over time (Alvarez et al., 2024; Wiek et al., 2011). The systematic reviews and syntheses also emphasize that the connection between pedagogical strategies and sustainability competencies is a burning frontier; nevertheless, empirical research is not always as in-depth across the disciplines and may be biased towards environmental aspects rather than the social or economic facets of sustainability (Cebrian and Pubill, 2015; Wiek et al., 2011).

In South Asia, South Asian countries (Bangladesh) are relatively low in their research in higher education on ESD, although national and international interest in sustainability is increasingly growing in policy discussions. Little empirical research is done on the college level in Bangladesh, and some of the studies are conducted on the co-curricular and extracurricular activities in state universities instead of their formal implementation in the curricula (Kayode, 2018). This regional disparity reflects the greater regional and national disparities found in syntheses of other parts of the world, which report a gap in policy promise to ESD and classroom application, such as insufficient content time, insufficient teacher training, and unequal incorporation of social and economic aspects of sustainability (Cebrian & Pubill, 2015). The Bangladesh-specific literature, therefore, indicates the urgent need to research how the policies of national sustainability, such as SDG-related ones, are implemented into the specific college curricula, teaching methods, textbooks, assessment, and extracurricular activities (Kayode, 2018). This type of evidence would complement the international and regional body of work and shed light on how the colleges in the Bangladeshi government could achieve whole-institution practices on ESD in accordance with SDG targets.

The conceptual and theoretical frameworks that are often used in ESD studies can be utilized to study integration in the case of a government college in Bangladesh. Whole-institution or whole-school/whole-college models purport systemic change in policy, pedagogy, assessment, and campus activities, claiming that the achievement of sustainability cannot be accomplished through the reform of the curriculum only but through concerted efforts in the whole institution (Pittaway & Cope, 2007; Cebrian & Pubill, 2015). To describe the process through which ESD can help to introduce changes in the outlook of students and their professional identities, transformative learning theories are often mentioned (Vaniev and Malt-Cullen, 2024; Alvarez et al., 2024). They consist of competency-based structures, e.g., key sustainability competencies or reference frameworks of program development, and help the institutions to map the curricula to the desired levels of competence (Martin-Sanchez et al., 2022; Wiek et al., 2011). Various pedagogical models bridging sustainability competencies and particular instructional models (e.g., project-based learning, service-learning and, interdisciplinary modules) have shown positive correlations between student engagement and competency development in different settings (Tarrant & Thiele, 2016; Wiek et al., 2011). Moreover, the notion of curriculum co-creation and student-staff collaboration as the two elements that contribute to relevance and ownership can be suggested as effective in terms of ensuring that ESD is embedded in higher education and that the local needs and capacity are considered (Pittaway and Cope, 2007; Bovill and Woolmer, 2018).

In creating such strands in the case of Bangladeshi government colleges, there are research gaps. College-level empirical research tracing the policy to classroom practice regarding policies and curriculum mapping, textbook analysis, and sustainability competencies evaluation along social, economic, and environmental lines is clearly required. As there has been very little empirical research on the topic of Bangladesh-specific and especially at the level of government colleges, integrative research that focuses on both co-curricular programs and curricular content would help to understand how co-curricular activities can impact the global sustainability education in Bangladesh (Kayode, 2018). In addition, regardless of strong international standards of competencies and pedagogy, it is necessary to conduct more context-specific studies that can examine how national sustainability policies are enacted within the Bangladeshi college curricula and how the teachers are equipped to teach using cross-disciplinary, transformational, and participatory approaches (Cebrian and Pubill, 2015; Abookire et al., 2020; Wiek et al., 2011). Lastly, there remains a gap in the study of the effect of textbooks and instructional materials on sustainability learning as well as the evaluation of how co-curricular and extra-curricular experiences intermingle with formal coursework to promote SDG-oriented competencies in government colleges (Kayode, 2018; Wiek et al., 2011).

RESEARCH METHODOLOGY

Research Approach and Design

This study used a qualitative research design in line with the exploratory objective of the study and the paucity of empirical research about Education for Sustainable Development (ESD) in government colleges of Bangladesh. The qualitative method was selected since the research aim was to learn how and why the sustainability themes (environmental, social, and economic) are incorporated in the curricula, pedagogy,

textbooks, and extracurricular activities, and how these processes are perceived by the key actors in their daily practice.

The study was based on an interpretivist/constructivist paradigm that presupposes the realities of ESD integration to be socially constructed by teachers, administrators, and students in particular institutional settings. Instead of quantitative measures of specific predetermined measures, the study was aimed at rich descriptions, meanings, and experiences. The designed research can be described as a qualitative multiple case study whereby several government colleges have been treated as distinct ESD integration cases. The analysis of the over a college has made it possible to compare the results based on the institutional contexts and a richer context-sensitive comprehension of the translation of ESD between policy and practice.

Study Setting and Selection of Colleges

The study was conducted in selected government colleges in Bangladesh that offer undergraduate programmes under the national higher education system. Government colleges were chosen because they: (a) enrol large numbers of students from diverse socio-economic backgrounds, (b) are directly regulated by national ministries and curriculum authorities, and (c) represent a key site where national commitments to SDG 4 and ESD are expected to be operationalised.

Colleges were selected purposively to ensure variation in:

1. Geographical context (e.g. metropolitan vs. district towns).

2. Academic streams (e.g. science, arts and social sciences, and business studies).

3. Institutional size and history (older, well-established colleges and relatively newer institutions).

This maximum-variation strategy enabled the study to capture different patterns and challenges of ESD integration across institutional types rather than focusing on a single “model” institution. Specific college names are anonymised in the thesis and are referred to as College A, College B, etc., to preserve confidentiality.

Participants and Sampling Strategy

Within each participating college, participants were selected purposively based on their expected knowledge and involvement with curriculum and teaching. Three main groups were included:

1. Academic staff – subject teachers and heads of departments who teach courses where sustainability content is likely to appear (e.g. environmental studies, social science, economics, science-related subjects) or who are involved in departmental curriculum decisions.

2. Institutional leaders/administrators – principals, vice-principals, or academic coordinators responsible for implementing national curriculum directives and overseeing co-curricular activities.

3. Students – undergraduate students who had completed at least one year of study and had exposure to relevant courses and activities, to reflect on how they encounter sustainability themes in their learning.

A combination of criterion-based and snowball sampling was used. Initial participants were identified through official college contacts and institutional roles; they then suggested other potential informants who were actively engaged in curriculum development, teaching, or student activities related to sustainability.

Participation was voluntary, and inclusion criteria for teachers and administrators were: (i) current employment in a government college, and (ii) involvement in teaching or academic management for at least one academic year. Students were required to be enrolled full-time and willing to share their learning experiences.

Data Collection Methods

To develop a holistic picture of ESD integration, the study used more than one qualitative data source:

1. Document analysis of curricula and institutional materials.
2. Semi-structured interviews with teachers and administrators.
3. (Where feasible) group or individual interviews with students.

This triangulation of sources allowed comparison between official curricular provisions and lived experiences in classrooms and college life.

Document Analysis

Document analysis focused on materials that formally guide teaching and learning in the selected colleges, including:

1. National and college-level syllabi and course outlines.
2. Prescribed textbooks and reading lists for selected courses.
3. Academic calendars.
4. College prospectuses, policy statements, and relevant notices.
5. Documents describing clubs, co-curricular, and extracurricular activities (e.g. environment clubs, social service clubs).

Documents were collected from departmental offices, libraries, official college websites and, where necessary, through participants. All documents were read in full and then imported into a word-processing or qualitative data analysis environment for systematic review. Particular attention was given to:

1. Explicit references to sustainability, environment, social justice, economic development, SDGs, or related concepts.
2. Learning outcomes or competencies linked to sustainability.
3. Suggested teaching and assessment methods that reflect ESD pedagogy (e.g., project work, community engagement, problem-based learning).

Semi-Structured Interviews

Semi-structured interviews were conducted with teachers and administrators to explore their understandings and practices regarding ESD integration. An interview guide was developed around several key domains, such as:

1. Understandings of sustainability and ESD.
2. Perceptions of how sustainability is reflected in existing curricula and textbooks.
3. Teaching strategies used to address sustainability themes.
4. Institutional support, constraints and professional development opportunities.
5. Views on co-curricular and extracurricular initiatives related to sustainability.
6. Suggestions for strengthening ESD in college curricula.

Interviews were conducted face-to-face where possible (or via telephone/online platform when necessary) in Bangla and/or English, depending on participant preference. Each interview lasted approximately 45–60 minutes and was audio-recorded with informed consent. Short field notes were taken after each interview to capture contextual details and preliminary reflections.

Student interviews (individual or small group discussions) followed a similar semi-structured format but focused on how students encountered sustainability themes in classes, textbooks, assignments, and club activities, and how these experiences shaped their awareness and attitudes.

Data Analysis Procedures

All interviews were transcribed verbatim and, where needed, translated into English while preserving key terms and meanings. Document excerpts relevant to sustainability and ESD were also extracted. The full dataset (interview transcripts and documentary extracts) was then subjected to thematic analysis.

Data analysis followed an iterative process that combined deductive and inductive coding:

1. **Familiarisation:** The researcher repeatedly read the transcripts and documents to gain an overview of the material and to note initial impressions.

2. **Initial coding:** A preliminary coding framework was developed based on the study's objectives, the theoretical and conceptual frameworks of ESD (environmental, social and economic dimensions; whole-institution approach; sustainability competencies), and key ideas from the literature. New codes were added inductively as they emerged from the data.

3. **Developing themes:** Codes with similar meanings were grouped to form broader categories and then refined into themes that captured patterns across colleges and participant groups (e.g. "fragmented curriculum integration," "textbook-driven sustainability," "constraints on transformative pedagogy," "co-curricular spaces as sustainability labs").

4. **Cross-case comparison:** Themes were examined within and across the different colleges to identify convergences, divergences and context-specific dynamics of ESD integration.

5. **Refinement and interpretation:** Themes were reviewed in relation to the research questions and theoretical framework, and illustrative quotations and document excerpts were selected to demonstrate key points in the results and discussion chapters.

Data management and coding were done manually or with the aid of a qualitative analysis software package (e.g. NVivo/Atlas.ti), depending on access and feasibility. An audit trail of coding decisions and theme development was maintained through analytic memos.

Ensuring Trustworthiness

Several strategies were employed to enhance the trustworthiness of the study:

Credibility: Triangulation of data sources (documents, teacher interviews, administrator interviews, student perspectives) was used to check the consistency of findings. Where feasible, preliminary interpretations were discussed informally with selected participants (member reflection) to confirm resonance with their experiences.

Transferability: Thick descriptions of the institutional context, participant roles and relevant features of the colleges were provided so that readers can judge the applicability of findings to other contexts.

Dependability: A clear documentation of the research process—including sampling decisions, data collection procedures, coding frameworks and analytic steps—was maintained, allowing external readers to follow the methodological logic.

Confirmability: Reflexive memos were kept acknowledging the researcher's positionality, assumptions and potential biases. Direct quotations from participants and excerpts from documents are used in the findings to demonstrate that interpretations are grounded in the data.

Ethical Considerations

Ethical approval for the study was obtained from the relevant institutional review/ethics committee and necessary permissions were sought from college authorities before data collection. All participants received an information sheet explaining the purpose of the study, the voluntary nature of participation, potential risks and benefits, and the intended use of the data.

Written or recorded verbal informed consent was obtained from each participant prior to interviews. Participants were assured that:

1. Their identities and the identities of their institutions would be kept confidential.
2. Pseudonyms would be used in all transcripts and publications.
3. They could decline to answer any question or withdraw from the study at any time without negative consequences.
4. Audio files, transcripts and documents would be stored securely (password-protected digital files and, where relevant, locked cabinets) and accessed only by the researcher.

Care was taken to minimise any perceived power imbalances, especially when interviewing students and staff in hierarchical institutional settings. Interviews were scheduled at times and locations convenient to participants, and data were reported in ways that avoid singling out identifiable individuals or institutions.

Findings

This paper examined ways of integrating Education for Sustainable Development (ESD) within the curriculum of government colleges in Bangladesh in terms of curriculum and textbooks, pedagogy and assessment, co-curricular activities, institutional conditions and perceived effect on students. They were analysed using thematic analysis of 12 in-depth interviews with teachers, administrators, and students (IDI 1-12) and demonstrate a complex image of half-fulfilling and yet promising ESD practice that is functioning under an exam-driven and resource-constrained system.

Fragmented and implicit curricular integration of ESD

In different cases, respondents indicated that ESD was found to be available yet scattered in the current curricula. Environmental Science, Biology, Geography, Economics, Political Science, Sociology, Business Studies, and Bangla Literature show sustainability issues, but fail to provide an integrated framework and language.

A science teacher noted that sustainability content is fragmented in that it is taught as several separate topics and not as an organising principle:

In the curriculum, these are usually separated into separate chapters instead of being a component of a bigger sustainability plan. Concerning the case study, the teacher might have chosen to employ group discussions as the assessment technique. With regard to the case study, the teacher could have opted to use group discussions as the assessment method.

In the same way, one of the principals pointed to the absence of curriculum mapping in subjects:

There are themes of sustainability, but they are not well-integrated... we have not yet had a complete curriculum map to show us where and how sustainability is in the curriculum. (IDI 2, principal)

This was summarised by an academic coordinator as subject-based silos:

Science and geography cover are the environmental issues, social science covers the social issues, economics and business studies cover the economic issues, but there is no integrated ESD model and language between departments. (IDI 5, academic coordinator)

Sustainability in humanities is usually implicit, whether it is in the writings of nature, poverty or social injustice. One teacher of Bengali literature remarked:

The Bangla literature syllabus contains numerous poems and stories that touch on nature, poverty, social injustice and rural life, but does not frame them as such- it is up to individual teachers to bring out these aspects. (IDI 4, teacher, Bangla)

Textbooks were generally described as exam-oriented, descriptive and lagging behind the contemporary ESD discussions. According to teachers, prescribed books either list causes of pollution without often asking students to consider local responses or ethical obligations (IDI 1) or are out of step with current developments... seldom incorporate SDGs onto the page or talk of interdisciplinary actions (IDI 2). Business and Economics teachers affirmed that CSR, ethics and environmental economics are usually covered in later chapters, which are usually hurried or pushed to the side before tests (IDI 3, IDI 8).

Islands of innovative pedagogy within an exam-driven system

The large classes and the high-stakes examinations determine pedagogical practices that are characterized by lectures and note-taking. The staff and students admitted that a significant portion of the teachers continue using lecture-based teaching due to large classes and the orientation to exams (IDI 2, principal) and that most classes are still associated with the preparation of notes to pass exams (IDI 11, student, Science).

The data in this broad trend show oceans of pedagogical innovation that are closely related to ESD principles. Some of the teachers mentioned group work, projects, case studies, debates, field observations and creative tasks as some of the ways of meeting the sustainability-related content. For example:

When educating about sustainability-related issues, I would employ group discussions, little projects and field observations... these strategies are more effective in creating awareness and practical skills. The following would be the suggested question: What is your understanding of the environmental issues related to overpopulation? The proposed question would be as follows: What do you know about environmental problems connected with overpopulation?

A Biology instructor also relied on the local ecological observations to relate theory and the environment in which one lives:

We occasionally view the diversity of plants in the locality or talk about garbage in the campus. The approaches assist students to relate theory with their immediate environment. (IDI 6, teacher, Biology)

Teachers used empathy-based and dialogic approaches in literature and social sciences. Students were required to pretend to be a village in the effects of erosion of a river, or to engage in simulated parliaments and policy discussions of rights, governance and environmental justice (IDI 4, IDI 7). Teachers of Business Studies noted that they used local firm case studies to discuss the CSR and ethical dilemma (IDI 8).

Nonetheless, the practices are still individualised and non-systematic, which depends on the initiative of inspired teachers but not on the system policy. As one principal commented:

Some creative educators would resort to project work, presentations and community surveys... but they must shift individual zeal to a collective pedagogical culture. (IDI 2, principal)

Assessment is misaligned with ESD competencies

Evaluation came out as a significant organizational limitation. Summative, written examinations that are recall-based dominate in the evaluation process across disciplines. The teachers and students concurred that the current exams are primarily about memorisation of definitions and lists (IDI 1) and checking whether we can remember definitions and diagrams (IDI 11).

Whereas some of the teachers do incorporate open-ended or problem-based questions, like assessing policies in sustainability terms or analyzing the CSR track record of a company, there is no out-and-clear framework for the assessment of the ESD competencies of critical thinking, systems thinking, collaboration, ethical reasoning, or civic engagement (IDI 3, IDI 8). Minimal marks are usually given to project work and presentations:

There are assignments in which students check the sustainability practices of a company, but the number of marks offered to them is relatively small when compared to theory examinations. Therefore, I would say that the children's capacity to grasp concepts in their second language is uninhibited. Thus, I would claim that the ability of the children to learn in their second language is not inhibited.

Students with an overt association with ESD to grading policies reported that they participated in it because of marks, that marks motivate behaviour, and that students have few marks on practical environmental action or community projects (IDI 11, student, Science). One of the Social Science students stated:

According to the respondents, more project-based assessments would help ESD become more solid... the college ought to integrate community service or sustainability projects into our course requirements. (IDI 10, student, Social Science)

All in all, assessment practices are ill-suited towards the goals of ESD, which strengthens reproduction of content as opposed to a transformational learning process.

Co-curricular and extracurricular activities as parallel ESD spaces

The environments of Co-curricular and extracurricular amenities- Environment, Science, Social Welfare, Cultural, Debating, and Entrepreneurship clubs-offer significant but peripheral venues in which ESD-related learning is attainable. The respondents reported various types of activities, such as tree-planting, campus clean-ups, awareness rallies, blood donation drives, debates, seminars, and cultural performances related to social and environmental problems (IDI 1, 2, 4, 5, 7, 8).

These activities were greatly seen as inculcating values, empathy, leadership, and civic responsibility. One teacher of literature remarked:

Our Cultural Club plays and recitations usually touch on social issues as well as gender violence, environmental degradation, etc. Students learn to sympathize with such issues as dowry, gender violence, and environmental degradation. (IDI 4, teacher, Bangla)

The administrators also added that students who participate in social welfare and environmental activities also acquire leadership competencies and empathy, and grow more aware of such challenges as waste, water consumption, and social injustice (IDI 2, principal; IDI 5, academic coordinator).

Such involvement is, however, usually incidental and erratic and is usually connected to certain days of observation. The process entails conflicts among the coordinators, as one of them mentioned:

Activities, rallies, essay competitions, and community clean-ups, etc., are all useful, but are they part of a sustainability strategy of ESD? (IDI 5, academic coordinator)

The students affirmed that such programmes as campus clean-ups or tree planting occurred only once. There is no routine follow-up or control of the observation of the campus cleanliness (IDI 11, student, Science). In addition to this, club activity is voluntary, which is often regarded as a sort of secondary activity to exam

preparation and personal coaching: the club activities are seen as secondary activities by many students to their actual academic studies (IDI 2, principal).

Practically, therefore, the co-curricular and extracurricular activities serve as parallel ESD spaces that do not necessarily support or even strengthen the formal curriculum.

Institutional conditions: moral encouragement without structural support

In terms of the institutional level, the data indicate that there is a trend of moral support and low structural commitment to ESD. According to the reports of the college leaders and coordinators, the environment- and society-related initiatives are typically welcomed by the administration:

The college administration usually helps us out when we suggest events concerning the environment. Upon identifying signs of mental health issues in a child, the teacher ought to engage a psychiatrist to determine whether the issue is psychological or physical. When the teacher notices that a child has developed some mental health-related problems, the psychiatrist should be consulted in order to find out whether the problem is psychological or physical.

Nevertheless, such encouragement is not supported by official policies, specific structures, or fixed resources. Members of the group kept referring to a lack of ESD policies, committees, or plans of action: there is no institutional policy on ESD that is clear-cut (IDI 1), and no specific ESD committee or policy... it is difficult to coordinate across departments (IDI 5).

Some of the respondents directly demanded national guidelines and college-level plans of ESD action that had their roles, budgets, and staff development:

I would like to see national guidelines on ESD in government colleges... on the college level, we can introduce a credit-bearing community engagement aspect which is based on sustainability. (IDI 2, principal)

They need a college-level ESD action plan... professional development programmes on ESD among teachers, and a little yearly budget on sustainability projects would be welcome. (IDI 5, academic coordinator)

Emerging impact and aspirations for a whole-college ESD approach

Regardless of the structural issue, the participants indicated emerging yet imbalanced effects of the ESD-related activities on the awareness, attitudes, and behaviours of students. Educators described that the students who participated in projects, clubs, and interactive classes are more aware of waste, plastic consumption, energy conservation, and social justice and may even bring this awareness to their homes and communities:

Students participating in projects or club activities are more aware of littering, the use of plastics, and energy conservation... some of them even initiate the conversation with their families about how the waste would be managed or the planting of trees. According to the researcher (IDI 1, teacher, Environmental Science), this is the way individuals ought to live.

According to students themselves, personal behaviour change and the development of social awareness were described:

I attempt to minimize plastic consumption and stand up when I witness injustice... your friends have also adopted the behaviour, but too many only think about marks and work. (IDI 10, student, Social Science)

Meanwhile, both employees and students emphasized that these effects are scarce and vulnerable, and they are concentrated among more active learners, and the general student body remains more focused on the exam outcomes, but not on the sustainability issues (IDI 1; IDI 2; IDI 11).

DISCUSSION

The qualitative study under consideration has analysed the impressions of teachers utilizing Bangladeshi government colleges as their object to study and impart Education for Sustainable Development (ESD) in curricula, pedagogy, and co-curricular activities. Overall, the findings also suggest that ESD is deemed important but conceptually fractured, structurally dismantled, and institutionally weakened. This is largely in agreement with the data on the international level, which indicates that ESD in higher education is mostly witnessed as an aspiration and not yet a completely integrated system of the curriculum.

Conceptualisations of ESD

The majority of interviewees mentioned ESD with environmental connotations (pollution, disposal of waste, planting trees), and partially and implicitly with social justice, citizenship, and economic development. This interpretively environment-intensive and development-light approach to sustainable development is in line with what Kagawa (2007) refers to as a dissonance in the account of sustainable development among the students, where the emphasis on environmental protection is foregrounded, and the social and economic issues are backgrounded. European and Asian universities have also been reported to have such conceptual disequilibrium, where sustainability is consistently linked to environmental training rather than an overhaul agenda.

The descriptions provided by the participants can be described in terms of competencies only in a partial respect to the major sustainability competencies proposed by Wiek et al. (systems, anticipatory, normative, strategic and interpersonal competencies). Even though awareness, responsibility and good behaviour were frequently described by the teachers, they were not often described in the higher-level systems thinking and anticipatory decision-making. This confirms the earlier concerns that tertiary education is increasingly inclined to aim at attitudinal transformation and awareness creation, rather than the whole gamut of transformative skills that ESD models require. At the same time, the insistence of teachers that ESD is intended to develop the students into good and socially responsible citizens is extremely close to the ESD learning objectives of UNESCO, which focus on the empowerment and action-oriented learning of all SDGs.

Curriculum integration

ESD issues in colleges were registered to be dynamically scattered over courses in civics, social science, Islamic studies, and environmental science, but rarely as a comprehensive course or a specifically designated ESD route. This is similar to the situation in Lambrechts et al. (2013), who surveyed the management curriculum in Belgium and discovered that sustainability competences were learned in intermittent and implicit ways, with insignificant breadth of systems and futuristic-oriented competences. The accounts by interviewees of a chapter here and there and one or two questions in the exam are indicative of a patchwork, similar to the systematic review finding that the concept of a comprehensive ESD curriculum and monitoring of it is uncommon in higher education.

The other significant observation that teachers offered was that syllabi and textbooks are centrally prescribed, and thus it is hardly possible to localise or design cross-disciplinary modules. Even though the central control can ensure at least some number of environmental issues are addressed, it can also contribute to what Stough et al. (2018) describe as curricular invisibility of sustainability: The ESD themes are taught in multiple courses but not assessed, evaluated, and integrated. Colleges in Bangladesh appear to be at the lower stage of curriculum mapping tools integration, though they are in search of the system that would audit the content of sustainability and ESD integration, which is still fragmented and refers to the initiative of separate educators.

Pedagogy and assessment

Pedagogically, the respondents also reported that they made extensive use of the lecture method of instruction that emphasized the use of public examinations, and minimal time was allocated to project work, field visits, or community-based education. It is quite the opposite of the active, experiential, and transformative pedagogies that are actively proposed in the ESD literature, e.g., service learning, problem-based projects, and head-hands-heart approaches. Other researchers have mentioned that these participatory methods play a central role in developing systems thinking, critical reflexiveness, and action competence; the experiences that the Bangladeshi

educators offer confirm that cultures of high examinations act as a clear obstacle to these opportunities (Sipos et al., 2008; Lozano et al., 2017).

The college grading systems of the two studied colleges were also marked by excessive memorization of textbooks to pass a written examination. Virtually all the participants indicated that sustainability competences lack clear outcomes or criteria for measuring learning. This is like the studies conducted by Shephard et al. (2015), who mention that the evaluation of higher education is not concerned with the results of ESD often enough, and sustainability is the concept that is typically perceived as tacit or latent in the existing course goals. Recent studies on ESD measurement claim more in support of performance-based work, vignettes, and portfolios to represent multifaceted conclusions and actions in sustainability dilemmas of the actual world; the present study conjectures that such inventions have failed to gain ground in conventional undergraduate instruction in Bangladeshi state colleges.

Institutional and systemic constraints

Interviewees kept on citing structural constraints since they felt they were overworked, had large classes, were not able to visit the field, were not encouraged by the institution, and lacked specialised training in ESD. These barriers are similar to those in cross-country studies of the sustainability work in universities. Velazquez et al. (2005) and Leal Filho et al. (2017) note that the failures of funding, time, staff development, and supportive governance to act as barriers to the process of approaching sustainability across the curriculum, research, and campus activities are documented. The systematic review by Lim et al. (2022) also suggests that the efforts of implementation in those situations where the institutions develop formal commitments to the SDGs are usually oriented to the most visible activities (e.g., awareness campaigns) rather than a radical transformation of their curriculum.

One feature of the Bangladeshi situation is that the centralisation of government college curriculum and assessment is so high. The teachers also described themselves as implementing National University or ministry-prescribed syllabi, not as curriculum co-designers, and this restricts the potential to experiment by using ESD-rich modules or local initiatives. This compares to the overlay of other very centralised systems, where ESD has a higher likelihood of being overlaid rather than being used to re-purpose programme objectives and graduate qualities. The descriptions in this paper suggest that, within institutional practice, with no obvious policy guidelines in place, the working load and working load reduction, and the fact of personal appreciation, the individual motivation of a teacher will not change much in institutional practice.

Co-curricular activities and student agency

It is against these shortcomings that teachers provided an account of different co-curricular programs, like environmental clubs, planting trees, debate competitions, relief work, etc., as the scenes where the themes of ESD are more evidently exercised. Trying to present the evidence of this on the global level, it has been demonstrated that even in the circumstances of the traditional SDGs-centred formal curricula, such co-curricular experiences may radically raise the levels of sustainability and SDGs-awareness among students. The engagement in sustainability-related extracurricular activities at Saudi universities is an example of this, as the author of the article, Abowardah (2024), concludes that the height of exposure to SDG awareness and self-reported behaviour change is strongly correlated.

However, in the present study, they were described as infrequent, highly dependent on the small group of committed educators or student leaders, and vaguely connected with course learning outcomes. This confirms bigger apprehensions that co-curricular ESD is more likely to be a parallel rather than an inborn component of student schooling. A better indication of the perceived interest of students in environmental and social action would be the more conscious connection of the content presented in the curriculum, the assessment activities, and community-based projects, such as other courses based on course-based service learning or SDG-related project courses.

Implications for policy and practice

The findings, when summed up, suggest that the government colleges in Bangladesh are at an initial to average stage between environmental add-on and complete institution ESD. Accessibility of the content pertaining to ESD in the textbooks, personal commitment and active student clubs by the teachers are good resources. The extent to which such colleges can implement the vision of the UNESCO of ESD as an agent of SDG-oriented change, though, is limited by conceptual narrowness, lack of curriculum integration, conservative pedagogy and systemic constraints.

Three priorities are unveiled in accordance with the experience in other parts of the world. First, policy wise, the ESD learning outcomes and competencies are to be directly included in the national curricula and college programme specifications, by relying on the already developed models such as Wiek et al. competency model and the UNESCO ESD Goals guide. Second, the educational authorities must not be afraid of making long-term investments in the professional development of teachers to transcend lecturing to active and community-based pedagogies that have been proven to support transformative sustainability learning. Third, systematic-like Curriculum mapping and assessment reform, which have been implemented in European universities, would enable colleges to identify the gaps and can enable them to identify ESD content presently and implement the sustainability competences in disciplines progressively.

The voices of teachers are placed in a larger literature in the study, and this contributes to one of the main messages, which is that the policies, which support ESD rhetorically, are not sufficient. ESD in state colleges will be outlying and non-structural to significant curricular space and assessment based on sustainability skills and competencies, and personal advocates of ESD rather than embedded in the day to day learning of students.

CONCLUSION

This qualitative research paper examined the existing knowledge and implementation of Education for Sustainable Development (ESD) at the colleges in Bangladesh. It illustrates, based on 12 intensive interviews with teachers, administrators, and students, that there is in fact a presence of sustainability-related content, but again, it is dispersed across various subjects, largely tacit in centrally prescribed curricula and textbooks. Even though some of the committed teachers implement participatory, situation-specific pedagogies, these are operating as a few islands in an otherwise massively lecture- and exam-based system. The test, which heavily relies on a written recall test, is still not in line with the ESD competencies such as critical thinking, system thinking, moral reasoning, and civic participation.

Environment, social welfare, debating and cultural clubs, co-curricular and extracurricular activities pose great platforms of experiential learning, leadership and values formation. They are, however, inherently largely event-oriented, optional, and too casual in regard to course outcomes or credit structures. The institutional support of ESD can be characterized by moral encouragement, but structural commitment: no ESD policies, committees, or budgets, and staff are barely or not trained in ESD.

Despite such limitations, the research documents the new but disproportionate student awareness and behaviour change, especially among students who participate in projects and clubs. To make the shift to the whole-college approach to ESD, policymakers and institutional leaders ought to: (i) institutionalise ESD competences in national and college-level programmes; (ii) reform assessment in ways that reward ESD-related learning; (iii) invest in long-term teacher education; and (iv) make co-curricular initiatives formal. Without such systemic intervention, ESD in government colleges will remain a dependency of champions and not an integral aspect of the daily operations of academia.

REFERENCES

1. Bateh, J., Heaton, C., Arbogast, G., & Broadbent, A. (2014). Defining sustainability in the business setting. Journal of Sustainability Management (JSM), 1(1), 1–4. https://doi.org/10.19030/jsm.v1i1.8386

2. Beasy, K., & Gale, F. (2020). Disrupting the status-quo of organisational board composition to improve sustainability outcomes: Reviewing the evidence. Sustainability, 12(4), 1505. https://doi.org/10.3390/su12041505
3. Bennett, C., Lilley, K., Yeatman, H., Parker, E., Geelhoed, E., Hanna, E., … & Robinson, P. (2010). Paving pathways: Shaping the public health workforce through tertiary education. Australia and New Zealand Health Policy, 7(1), 2. https://doi.org/10.1186/1743-8462-7-2
4. Carayannis, E., Barth, T., & Campbell, D. (2012). The quintuple helix innovation model: Global warming as a challenge and driver for innovation. Journal of Innovation and Entrepreneurship, 1(1), 2. https://doi.org/10.1186/2192-5372-1-2
5. Chankseliani, M., & McCowan, T. (2020). Higher education and the Sustainable Development Goals. Higher Education, 81(1), 1–8. https://doi.org/10.1007/s10734-020-00652-w
6. Dale, A., & Newman, L. (2005). Sustainable development, education and literacy. International Journal of Sustainability in Higher Education, 6(4), 351–362. https://doi.org/10.1108/14676370510623847
7. Dempsey, N., Bramley, G., Power, S., & Brown, C. (2011). The social dimension of sustainable development: Defining urban social sustainability. Sustainable Development, 19(5), 289–300. https://doi.org/10.1002/sd.417
8. Friedman, J., York, H., Graetz, N., Woyczynski, L., Whisnant, J., Hay, S., … & Gakidou, E. (2020). Measuring and forecasting progress towards the education-related SDG targets. Nature, 580(7805), 636–639. https://doi.org/10.1038/s41586-020-2198-8
9. King, M., Widdowson, J., Davis, J., & Flint, C. (2014). Exploring scholarship and scholarly activity in college-based higher education. Journal of Perspectives in Applied Academic Practice, 2(1). https://doi.org/10.14297/jpaap.v2i1.103
10. Savage, E., Tapics, T., Evarts, J., Wilson, J., & Tirone, S. (2015). Experiential learning for sustainability leadership in higher education. International Journal of Sustainability in Higher Education, 16(5), 692–705. https://doi.org/10.1108/ijshe-10-2013-0132
11. Smith, G. (2011). Developing a sustainability plan at a large U.S. college of education. Journal of Teacher Education for Sustainability, 13(2), 5–16. https://doi.org/10.2478/v10099-011-0011-3
12. Stough, T., Ceulemans, K., Lambrechts, W., & Cappuyns, V. (2018). Assessing sustainability in higher education curricula: A critical reflection on validity issues. Journal of Cleaner Production, 172, 4456–4466. https://doi.org/10.1016/j.jclepro.2017.02.017
13. Yarime, M., Trencher, G., Mino, T., Scholz, R., Olsson, L., Ness, B., … & Rotmans, J. (2012). Establishing sustainability science in higher education institutions: Towards an integration of academic development, institutionalization, and stakeholder collaborations. Sustainability Science, 7(Suppl. 1), 101–113. https://doi.org/10.1007/s11625-012-0157-5
14. Çelikdemir, D., Günay, G., Katrinli, A., & Alpbaz, S. (2017). Defining sustainable universities following public opinion formation process. International Journal of Sustainability in Higher Education, 18(3), 294–306. https://doi.org/10.1108/ijshe-06-2015-0105
15. Abookire, S., Plover, C., Frasso, R., & Ku, B. (2020). Health design thinking: An innovative approach in public health to defining problems and finding solutions. Frontiers in Public Health, 8. https://doi.org/10.3389/fpubh.2020.00459
16. Álvarez, A., Ramani, S., & Volante, L. (2024). Service-learning as a niche innovation in higher education for sustainability. Frontiers in Education, 9. https://doi.org/10.3389/feduc.2024.1291669
17. Bovill, C., & Woolmer, C. (2018). How conceptualisations of curriculum in higher education influence student-staff co-creation in and of the curriculum. Higher Education, 78(3), 407–422. https://doi.org/10.1007/s10734-018-0349-8
18. Cebrián, G., & Pubill, M. (2015). Competencies in education for sustainable development: Exploring the student teachers' views. Sustainability, 7(3), 2768–2786. https://doi.org/10.3390/su7032768
19. Chang, Y., & Lien, H. (2020). Mapping course sustainability by embedding the SDGs inventory into the university curriculum: A case study from National University of Kaohsiung in Taiwan. Sustainability, 12(10), 4274. https://doi.org/10.3390/su12104274
20. Kayode, B. (2018). Communication management in distance learning scale validation. Malaysian Online Journal of Educational Management, 6(3), 29–47. https://doi.org/10.22452/mojem.vol6no3.2

21. Martín-Sánchez, A., González-Gómez, D., & Jeong, J. (2022). Service learning as an education for sustainable development (ESD) teaching strategy: Design, implementation, and evaluation in a STEM university course. Sustainability, 14(12), 6965. https://doi.org/10.3390/su14126965
22. Pittaway, L., & Cope, J. (2007). Entrepreneurship education. International Small Business Journal: Researching Entrepreneurship, 25(5), 479–510. https://doi.org/10.1177/0266242607080656
23. Tarrant, S., & Thiele, L. (2016). Practice makes pedagogy: John Dewey and skills-based sustainability education. International Journal of Sustainability in Higher Education, 17(1), 54–67. https://doi.org/10.1108/ijshe-09-2014-0127
24. Vaniev, A., & Malt-Cullen, M. (2024). Mapping pedagogies of education for sustainable development in Scottish higher education institutions. Journal of Adult and Continuing Education, 31(1), 211–231. https://doi.org/10.1177/14779714241260528
25. Wiek, A., Withycombe, L., & Redman, C. (2011). Key competencies in sustainability: A reference framework for academic program development. Sustainability Science, 6(2), 203–218. https://doi.org/10.1007/s11625-011-0132-6*
26. Abowardah, E. S. (2024). Students' perception of sustainable development in Saudi universities: Awareness of the UN Sustainable Development Goals. Sustainability, 16(4), 1483. https://doi.org/10.3390/su16041483
27. Cebrián, G., & Junyent, M. (2015). Competencies in education for sustainable development: Exploring the student teachers' views. Sustainability, 7(3), 2768–2786. https://doi.org/10.3390/su7032768
28. Cebrián, G., Junyent, M., & Mulà, I. (2020). Competencies in education for sustainable development: Emerging teaching and research developments. Sustainability, 12(2), 579. https://doi.org/10.3390/su12020579
29. Kagawa, F. (2007). Dissonance in students' perceptions of sustainable development and sustainability: Implications for curriculum change. International Journal of Sustainability in Higher Education, 8(3), 317–338. https://doi.org/10.1108/14676370710817174
30. Lambrechts, W., Mulà, I., Ceulemans, K., Molderez, I., & Gaeremynck, V. (2013). The integration of competences for sustainable development in higher education: An analysis of bachelor programs in management. Journal of Cleaner Production, 48, 65–73. https://doi.org/10.1016/j.jclepro.2011.12.034
31. Leal Filho, W., Wu, Y.-C. J., Brandli, L. L., Avila, L. V., Azeiteiro, U. M., Caeiro, S., & Madruga, L. R. D. R. G. (2017). Identifying and overcoming obstacles to the implementation of sustainable development at universities. Journal of Integrative Environmental Sciences, 14(1), 93–108. https://doi.org/10.1080/1943815X.2017.1362007
32. Lim, C. K., [and co-authors]. (2022). Systematic review of education sustainable development implementation in higher education curricula. Sustainability, 14(20), 13241. https://doi.org/10.3390/su142013241
33. Shephard, K., Harraway, J., Lovelock, B., Mirosa, M., Skeaff, S., Slooten, L., Strack, M., Furnari, M., Jowett, T., & Deaker, L. (2015). Seeking learning outcomes appropriate for education for sustainable development and for higher education. Assessment & Evaluation in Higher Education, 40(6), 855–866. https://doi.org/10.1080/02602938.2015.1009871
34. Sipos, Y., Battisti, B., & Grimm, K. (2008). Achieving transformative sustainability learning: Engaging head, hands and heart. International Journal of Sustainability in Higher Education, 9(1), 68–86. https://doi.org/10.1108/14676370810842193
35. Stough, T., Ceulemans, K., Lambrechts, W., & Cappuyns, V. (2018). Assessing sustainability in higher education curricula: A critical reflection on validity issues. Journal of Cleaner Production, 172, 4456–4466. https://doi.org/10.1016/j.jclepro.2017.02.017
36. UNESCO. (2017). Education for Sustainable Development Goals: Learning objectives. UNESCO. ISBN 978-92-3-100209-0.
37. Velazquez, L., Munguia, N., & Sanchez, M. (2005). Deterring sustainability in higher education institutions: An appraisal of the factors which influence sustainability in higher education institutions. International Journal of Sustainability in Higher Education, 6(4), 383–391. https://doi.org/10.1108/14676370510623865
38. Wiek, A., Withycombe, L., & Redman, C. L. (2011). Key competencies in sustainability: A reference framework for academic program development. Sustainability Science, 6(2), 203–218. https://doi.org/10.1007/s11625-011-0132-6