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# Sustainability Leadership Practices of Administrators on Quality Education for Nibras International School: Basis for a Recommended Program

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***ABSTRACT:*** *Guided by Sustainable Development Goal 4 (SDG 4), this study examined how administrators at an international school in Dubai, United Arab Emirates, exercise sustainability leadership to advance quality education. Using an exploratory sequential mixed-methods design, the study interviewed 15 administrators and analyzed their narratives through hybrid deductive–inductive thematic analysis organized around seven sustainability leadership domains. The resulting themes were converted into a validated 70-indicator survey (Cronbach's α = .842) answered by 93 teachers. Administrators understood sustainability leadership as a systemic, long-term orientation enacted through evidence-based, adaptive planning and relational, participatory leadership, with an enduring shared culture as its aim. They reported integrating school systems, diagnosing challenges with stakeholders, sharing responsibility, communicating a common vision, planning collaboratively from data, using stories and recognition, and institutionalizing practice. For quality education, these accounts translated into holistic, inclusive, and data-informed learning, while revealing constraints in resources, community mobility, emerging technology, and climate. Teachers rated the practices as substantially implemented overall (M = 3.25); Creating Shared Purpose and Vision obtained the highest grand mean (M = 3.27) and Co-Designing Sustainability Strategy the lowest (M = 3.24), although domain differences were negligible and standard deviations (0.85–1.16) showed considerable variation among teachers. Integration revealed a possible leader–teacher perception gap, as the collaboration and co-design that administrators described were not experienced equally across the teaching staff. These findings informed the Sustainability Leadership Capability Program, "Leading the Class of Change," which prioritizes collaborative co-design, evidence-informed diagnosis, monitoring, and institutional continuity; its effectiveness awaits expert validation and piloting.*

***KEYWORDS:*** *exploratory sequential mixed methods, international school, quality education (SDG 4), school administrators, sustainability leadership*

## I. INTRODUCTION

The transition to the post-pandemic "new normal" has reshaped the educational landscape, compelling schools to remain responsive and future-oriented amid continuing disruption. School leaders are now expected to sustain institutional continuity through adaptive management, sound decision-making, and well-planned sustainability practices. Rather than settling into a fixed state, they must continually build collective resilience and adaptation

[1], driving recovery while safeguarding stability and instructional quality [2]. UNESCO [3] stressed that educational institutions must embed sustainability principles in their systems and leadership structures, noting that sustainability initiatives tend to remain fragmented without coherent leadership support and institutional commitment. The leadership mindset of school administrators may therefore shape how teachers understand, value, and translate sustainability principles into educational practice.

In 2015, the United Nations adopted the 2030 Agenda for Sustainable Development and its 17 Sustainable Development Goals (SDGs) [4]. Goal 4 seeks to ensure inclusive and equitable quality education and to promote lifelong learning, and education is regarded both as a standalone goal and as a driver of all the other goals [3]. The idea predates the SDGs: Education for Sustainable Development (ESD) was formally introduced in 1992 within Agenda 21 of the United Nations Conference on Environment and Development [5]. Teachers are central to translating SDG principles into instruction. Pattung and Omaweng [6] found that teacher-led discussion ranked first in promoting students' knowledge and awareness of the SDGs, whereas Afandi and Rachmatdullah [7] found that the impact of SDG-based education was constrained by teachers' limited training and resources. How leaders support teachers in this work is therefore a pressing institutional concern.

Several studies have reported a strong positive relationship between leadership practices and teachers' performance and instructional effectiveness [8], [9], [10]. Leadership competencies have been described as a driving force for embedding sustainability in academic settings [11] and as the cornerstone of sustainable school improvement [12], and Kilag et al. [13] argued that leaders who support teachers holistically help develop resilient and motivated educators. Three gaps nonetheless remain. Empirically, few studies have examined school administrators' sustainability leadership mindset together with the extent to which their sustainability practices for SDG 4 are implemented as perceived by teachers; existing work tends to focus on teachers and students. Methodologically, no dedicated exploratory sequential mixed-methods design has been applied to capture both leaders' accounts and teachers' assessments. Contextually, evidence is scarce on private international schools operating in multicultural settings, where leadership teams and faculties are drawn from many national education systems.

This study adopted the sustainability leadership capability framework described by Thompson [14], who defines sustainability leadership as "mobilizing others to make progress on sustainability challenges" and identifies seven domains: systems thinking, diagnosing sustainability challenges, collaborating, creating shared purpose and vision, co-designing sustainability strategy, influencing and storytelling, and embedding sustainability practices. The literature supports each domain. Systems thinking enables leaders to see how decisions in one part of a school affect others; UNESCO [15] argued that leaders exercise this influence only when given authority over resources, personnel, and instruction, and Ferdig and Wright [16] warned that leaders lacking relational awareness exercise authority without recognizing their place in an interdependent system. Diagnosis matters because barriers to SDG integration, such as a lack of materials, inadequate professional development, and heavy workload [17], and a gap between teachers' awareness and classroom practice [18], are organizational as well as individual. Collaboration and shared vision depend on leaders who involve teachers and stakeholders in reform [19], [13], particularly where educators hold only a general understanding of the SDGs [20]. Co-designing strategy requires institutional support and informed decision-making [21], [22]; influencing and storytelling depend on leaders who communicate sustainability with a positive, inspiring tone [23], [24]; and embedding requires that sustainability be built into planning, policy, and professional learning [25], [26]. Taken together, the domains function as interconnected competencies: systems thinking and diagnosis provide the analytical foundation; collaboration, shared vision, and co-design enable collective action; and influencing and embedding sustain long-term institutional commitment.

Nibras International School, a private American-curriculum school in Dubai that operates within the International Schools Partnership (ISP), offered a suitable setting for this inquiry because of its diverse leadership structure and multinational faculty. Because school leaders are expected to exercise stewardship over ESD frameworks [27], and capacity-building and context-specific leadership programs have been recommended to

strengthen their resilience [13], the study also aimed to produce an evidence-based program for the school's administrators.

Specifically, the study sought to determine (a) how the school administrators understand the concept of a sustainability leadership mindset; (b) their practices in embedding this mindset in their units or school in terms of systems thinking, diagnosing sustainability challenges, collaborating, creating shared purpose and vision, co-designing sustainability strategy, influencing and storytelling, and embedding sustainability practices; (c) the sustainability practices for quality education (SDG 4) drawn from their narratives on embedding sustainability practices; (d) the extent of implementation of these practices as perceived by teachers; and (e) the program that can be recommended to enhance the administrators' sustainability leadership practices on quality education.

The study was anchored on three complementary theories. Transformational Leadership Theory [28], [29] explains how leaders inspire followers toward shared goals through idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration, framing administrators as role models who build a shared purpose and develop people's capacity for quality education. Systems Theory [30] views the school as a set of interdependent components (administrators, teachers, students, policies, resources, and partnerships) in which change in one part affects the whole [31]; system leaders recognize the larger system and act across it [32], and sustainability challenges require solutions that integrate multiple components and disciplines [33]. Sustainable Development Theory, rooted in the Brundtland Commission's definition of development that meets "the needs of the present without compromising the ability of future generations to meet their own needs" [34], positions administrators as change agents who prepare their institutions for the future. Transformational leadership theory informed questions (a) to (c), systems theory questions (b) to (d), and sustainable development theory the Recommended Program in question (e). Together, these perspectives informed the study's Input–Process–Output model: the administrators' sustainability leadership mindset across the seven domains (input) was explored through interviews whose themes were converted into a teacher survey and then integrated with the survey results (process), yielding a Recommended Program to enhance sustainability leadership practices on quality education (output).

## II. METHODOLOGY

### 2.1 Research Design

This study employed an exploratory sequential mixed-methods design [35], beginning with qualitative data collection and analysis, followed by the development of an instrument from the qualitative findings and a quantitative survey phase. The design suits problems that call for in-depth understanding where data on the phenomenon are unavailable [36] and where instruments must be sensitive to a specific cultural population [35]. Since no existing tool captured administrators' sustainability leadership practices in a multicultural international school, semi-structured interviews, which use open-ended and follow-up questions that allow unanticipated themes to emerge [37], were conducted first, and their themes were then translated into a context-specific survey. Integrating both phases grounded the Recommended Program in administrators' narratives and in teachers' measured perceptions.

### 2.2 Research Locale

The study was conducted at Nibras International School, a private school in Dubai, United Arab Emirates, that offers an American curriculum from kindergarten through high school to more than 1,400 students representing over 90 nationalities. The school is accredited by the New England Association of Schools and Colleges (NEASC), is regulated by Dubai's Knowledge and Human Development Authority (KHDA), whose mandate includes advancing sustainable development [38], and belongs to the ISP network. Its stated curriculum aims to develop learners who can "solve global issues with sustainable solutions," aligning with SDGs 4, 8, 11, and 17. Although the school had not published a formal SDG impact report or sustainability dashboard, its commitments under the ISP's environmental, social, and governance principles, together with its inquiry-based, service-learning, and global-citizenship programs, made it an appropriate setting.

2.3 Participants and Sampling

The population consisted of all 144 employees on the school's official records in Academic Year 2026–2027: 19 administrators and 125 teachers (70 in the elementary and 55 in the secondary division). Total population (census) sampling [39], [40] was initially planned for both phases. Because participation was voluntary and in-depth interviews are demanding, the qualitative phase used purposive sampling [41], including administrators who held an administrative post and had sufficient leadership experience to speak meaningfully about sustainability leadership and quality education. The census approach was retained for the quantitative phase. Thirty employees (4 administrators and 26 teachers) took part in the pilot test and were excluded from the main data collection. In the main stage, all 15 remaining administrators (78.9% of 19) were interviewed and 93 of the 99 eligible teachers (93.9%) completed the survey, giving an analytic sample of 108 participants; overall, 138 employees (95.8%) took part at least once. Because responding was voluntary, the teacher respondents are treated as covering a large share of the faculty rather than as a statistically representative sample.

The 15 administrators comprised four senior or divisional leaders (principals, assistant principals, and the dean of students), six academic middle leaders heading subject departments, four specialist leaders in counseling, inclusion, safeguarding, and data and assessment, and one leader in institutional communication (the school marketing officer). They represented 13 nationality or national-origin categories from Asia, the Middle East and North Africa, sub-Saharan Africa, Europe, and North America; none was Emirati. Participants are identified by code (P01–P15), position, and nationality. Position and nationality served only as interpretive context: each account was read in light of the speaker's remit, and nationality was not treated as the reason for an individual's view unless the excerpt itself indicated such a link.

2.4 Research Instruments

Two researcher-developed instruments were used. The interview guide (for questions a to c) was adapted from Thompson's [14] seven-domain framework, with two domains relabeled for this study as Implementing Systems Thinking and Strengthening Stakeholder Collaboration. Its first two parts contained 14 open-ended questions on the administrators' understanding of sustainability leadership and their practices in each domain, and its third part contained seven questions on sustainability practices for quality education. Participants were free to elaborate beyond the questions.

The teacher survey (for question d) contained 70 indicators, ten per domain, introduced by the stem "My school administrators…". The indicators were developed from the qualitative findings: administrators' statements were coded and organized into categories within each domain, and recurring practices and distinct context-specific insights were translated into clear, observable statements that were reviewed for relevance, clarity, and alignment with their domain. The indicators therefore represent a context-specific operationalization of the administrators' reported practices rather than a literature-derived scale. Teachers rated each indicator on a four-point scale, with mean ranges interpreted as Fully Implemented (4; 3.26–4.00), Substantially Implemented (3; 2.51–3.25), Partially Implemented (2; 1.76–2.50), and Minimally Implemented (1; 1.00–1.75).

2.5 Validation and Reliability of Instruments

Content validity [42] was established by three experts, in educational leadership and management, research instrument development, and sustainable education and the SDGs, who reviewed the instruments for relevance, clarity, representativeness, and appropriateness of language using a five-point validation scale adopted, with permission, from the Education Department of Richwell Colleges, Incorporated. The instruments received favorable ratings and were revised according to the panel's recommendations. Face validity [43] was checked by advisers, language specialists, and school staff outside the main sample. The survey was then pilot-tested with 30 respondents who were excluded from the main sample [44] and obtained a Cronbach's alpha of .842, indicating good internal consistency. This coefficient applies to the instrument as a whole; domain-level coefficients were not computed, so the reliability of each ten-item domain as a separate subscale was not separately established. Feedback from pilot respondents and experts was used to refine the items before final administration.

2.6 Data Collection Procedure

Following ethics clearance and approval from the school's Research Committee, data were collected over three weeks in the first term of Academic Year 2026–2027. In Week 1, one-to-one semi-structured interviews were held in the administrators' own workspaces at pre-arranged times; with written consent, each interview was video-recorded and later transcribed. In Week 2, the transcripts were thematically analyzed, the survey was constructed, and pilot and reliability testing were completed. In Week 3, the survey was administered in printed or online form according to each teacher's preference; online respondents completed it individually during a group session on campus, and printed copies were distributed and collected personally by the researcher. Responses were coded and entered into SPSS Version 25.

2.7 Data Analysis

Qualitative data (questions a to c) were analyzed using Braun and Clarke's [45] six-phase thematic analysis: familiarization, initial coding, searching for themes, reviewing themes, defining and naming themes, and reporting [46]. NVivo supported data organization, coding, and retrieval. Because the interview guide was organized around the seven domains, the analysis followed a theory-informed, hybrid deductive–inductive approach in which the domains served as a priori categories while the codes and themes within each domain were derived from participants' narratives. For question (a), responses to all seven probe questions were treated as one dataset; codes were grouped into categories regardless of the question that prompted them, and a category was retained only when supported by excerpts from multiple participants. For question (c), the categories within each domain were consolidated into one overarching theme, and categories resting on a single account or diverging from the general pattern were retained because they qualify the main findings. A documented audit trail was maintained throughout.

Quantitative data (question d) were summarized using frequencies, percentages, weighted means, and standard deviations. No inferential tests were performed, so differences among items and domains are described as descriptive rather than statistically significant. Means were rounded to two decimal places before classification, and because the verbal categories rest on fixed cutoffs, the means and standard deviations rather than the verbal labels were treated as the primary basis of interpretation. The two datasets were then integrated domain by domain in a joint display to identify convergence and divergence, and this integration informed the Recommended Program (question e).

The first author has worked in education for more than two decades, including as a mathematics department head and principal in the Philippines and, since August 2021, as a mathematics teacher at the research locale. This experience in both administrative and classroom roles motivated the inquiry but may also bring preconceptions. To limit their influence, the findings were grounded in participants' own accounts, the analysis followed a systematic and documented procedure, the instruments were expert-validated, and administrators' narratives were compared with teachers' independent ratings.

2.8 Ethical Considerations

The study was reviewed and approved by the Research Ethics Committee of St. Paul University Manila (Ethics Review Clearance for Proposal No. 2026-214-IDA-CELA, issued July 21, 2026), and the proposal was also reviewed by the school's Research Committee. All participants were briefed on the study's purpose, procedures, and their rights, and signed informed consent forms, including consent to the video recording of interviews. Participation was voluntary, and participants could skip questions or withdraw at any time without penalty. Identities were replaced with codes, no names were recorded on the instruments, and results were reported in aggregate. Data were handled in accordance with the Data Privacy Act of 2012 (Republic Act 10173); electronic files are password-protected and will be retained until December 2031, after which they will be permanently deleted, and printed documents will be shredded.

 

## III. Results and Discussion

### 3.1 Administrators' Understanding of the Sustainability Leadership Mindset

Thematic analysis of the administrators' responses yielded four overarching themes and twelve categories, presented in Table 1 with representative excerpts.

**Table 1. School Administrators' Concept of Sustainability Leadership Mindset**

| Overarching Theme | Category (Participants) | Sample Excerpts |
|---|---|---|
| **Theme 1. Adopting a Systemic and Long-Term Orientation** | 1.1 Interconnected and Holistic School System (P01 – P15) | P01 "every part of the school is connected, and collaboration across subjects creates the greatest impact" P08 "we can't plan in isolation, so leadership has to meet regularly just to make sure we're not accidentally working against each other" P01 "creating a school culture where environmental responsibility, social well-being, and efficient resource management are integrated into everyday decisions and learning" P10 "making decisions that benefit students, teachers, parents, and the wider community while thinking about their long-term impact" P06 "ensuring that the systems, practices, relationships, and values within the school can continue to thrive over time" |
| | 1.2 Long-Term Benefit for the School Community (P01, P02, P05, P06, P07, P09, P10, P13, P14, P15) | |
| **Theme 2. Applying Strategic, Evidence-Based, and Adaptive Practice** | 2.1 From Reactive Fixes to Root-Cause Understanding (P01, P04, P06, P07, P08, P09, P10, P11, P13, P15) | P01 "experience shifted me from reactive problem solving to designing processes" P09 "sustainability leadership has to start with genuinely understanding the real problem, not just reacting to the first complaint" P10 "It's less about having one big answer and more about constantly checking where the gaps actually are" P11 "taught me sustainability challenges are often already visible to the people living them day to day, so listening comes before diagnosing" P05 "comes from recognizing gaps, setting achievable goals, and improving step by step rather than expecting immediate change" P02 "this is still a work in progress for next year — every time we get a good result, I see it as space to improve further…become an ongoing cycle rather than something you finish" |
| | 2.2 Clear, Measurable, Evidence-Based, and Context-Responsive Planning (P03, P04, P05, P07, P08, P09, P13, P14, P15) | |
| | 2.3 Systematic Implementation, Monitoring, and Continuous Improvement (P02, P05, P07, P10, P11, P12, P13, P14, P15) | |
| **Theme 3. Fostering Relational, Participatory, and Empowering Leadership** | 3.1 Shared Ownership and Collaborative Problem-Solving (P01, P02, P04, P05, P06, P07, P08, P09, P10, P11, P13, P14, P15) | P10 "What makes it meaningful is that once everyone feels accountable for their part…becomes something we're actually building together" P15 "I challenge the teachers and staff to come on board and solve it together, rather than me just handing down a fix" P10 "I genuinely feel we're at a good level now, and that shift from 'my responsibility' to 'our shared practice' is really what sustainability leadership has come to mean for me" P05 "collaboration only feels complete once every stakeholder group is actually in the room, not just staff and students" P15 "less about introducing new initiatives and more about empowering people to lead meaningful change themselves. I now believe that when teachers feel trusted, students have a genuine voice, and collaboration becomes part of the culture" P06 "What made the collaboration meaningful was the trust, |
| | 3.2 Inclusive Participation, Empowerment, and Capacity Building (P01, P03, P05, P06, P08, P09, P11, P12, P13, P15) | |
| | 3.3 Trust and Relationships as the Foundation (P01, P03, P06, P07, P08, P13, P14, P15) | |

| Overarching Theme | Category (Participants) | Sample Excerpts |
|---|---|---|
| | 3.4 Influence through Communication, Modeling, Storytelling, and Recognition (P01 – P15) | openness, and common purpose behind it" P11 "As a data person, I always say numbers don't have heart, but a story does… actual story people could connect with" |
| **Theme 4. Cultivating a Shared and Enduring Sustainability Culture** | 4.1 Shared Vision as Common Direction and Purpose (P01, P03, P05, P06, P07, P10, P11, P13, P14, P15) | P13 "it's about aligning the school's messaging with the school's values… this is important in ensuring that we are able to drive trust" P09 "gives people a common purpose and helps sustainability become part of the school's identity rather than just another project" P04 "it comes from one small conversation that gets repeated until it becomes normal" P14 "I now value consistency over quick wins, continuous learning over comfort, and meaningful progress over perfection" P07 "has evolved from focusing on individual initiatives to creating a culture where sustainability is embedded in everyday teaching, learning, and decision-making" |
| | 4.2 Sustainability as Part of School Culture and Identity (P02, P03, P04, P07, P08, P09, P11, P13, P15) | |
| | 4.3 Consistency and Long-Term Continuity (P01, P02, P04, P05, P06, P09, P14, P15) | |

*Note.* P01–P15 = participant codes. Sample excerpts are shown once for each theme and apply to all of its categories.

Theme 1, Adopting a Systemic and Long-Term Orientation, is the cognitive foundation of the mindset. All 15 administrators described the school as an interconnected whole ("every part of the school is connected," P01; leadership "can't plan in isolation," P08), and ten weighed decisions by their long-term effect on the school community. Rather than defining sustainability as a program or department, they described it as a property of how the whole school is led. This mirrors the systems-thinking competency in the literature. Ferguson et al. [23] reported that, without a common institutional structure, teachers implemented sustainable development education according to personal preference, producing fragmented student experiences. The administrators' insistence on regular coordination reflects the relational awareness that Ferdig and Wright [16] regarded as necessary, and their view of the school as interdependent parts is consistent with the coordinated, multi-level intervention described by Alfathy et al. [47].

Theme 2, Applying Strategic, Evidence-Based, and Adaptive Practice, represents the method of the mindset. Administrators described a maturation "from reactive problem solving to designing processes" (P01), an insistence on "genuinely understanding the real problem, not just reacting to the first complaint" (P09), and planning that is specific, monitored, and continuously improved, "an ongoing cycle rather than something you finish" (P02). These strands correspond to the diagnostic competency in the literature, which locates barriers to SDG integration in institutional conditions [17] and in an awareness–practice gap among teachers [18]. The emphasis on root causes echoes arguments that effective decisions begin with diagnosing competing values and options [48] and anticipating consequences [49], [50], [51], while the reliance on clear, reviewable plans is consistent with evidence that institutions with detailed implementation strategies integrate the SDGs more effectively [25], [22], [52].

Theme 3, Fostering Relational, Participatory, and Empowering Leadership, represents the human mechanism of the mindset. Administrators saw sustainable solutions as built with others, choosing to "solve it together, rather than me just handing down a fix" (P15), and described a shift "from 'my responsibility' to 'our shared practice'" (P10). Collaboration was considered complete only "once every stakeholder group is actually in the room" (P05), trust was described as a precondition for participation (P06), and all 15 administrators described influencing others through communication, modeling, storytelling, and recognition. This theme aligns with literature on involving teachers in reform [19], sharing planning responsibility [13], providing ongoing institutional support and training [21], [47], and communicating sustainability positively [23], [18], [53], [24]. Trust, however, received less direct

attention in the reviewed literature than it did from the participants, who treated it as foundational; on this point, the data extend the literature.

Theme 4, Cultivating a Shared and Enduring Sustainability Culture, represents the intended result. A shared vision "gives people a common purpose and helps sustainability become part of the school's identity rather than just another project" (P09); culture change "comes from one small conversation that gets repeated until it becomes normal" (P04); and leadership values "consistency over quick wins" (P14). This emphasis on a common language and repeated engagement responds to findings that many educators hold only a general understanding of the SDGs [20] and that teachers in Pakistan [54] and beginning teachers in Nigeria [55] have limited sustainability knowledge.

The four themes build on one another: systems thinking provides the lens, strategic and adaptive practice the method, relationships the means, and culture the intended result. The mindset is thus cognitive, methodological, relational, and cultural, and it mapped closely onto Thompson's [14] framework, with additional emphasis on continuous adaptation, trust, capacity building, and continuity. No theme belonged to a single group of leaders. Senior leaders (e.g., P05 and P15) emphasized sequencing and continuity, department heads expressed the same ideas through subject planning and cross-departmental coordination, specialist leaders (P06, P08, P09, and P11) gave weight to trust, listening, and individual learners, and the marketing officer (P13) contributed an outward-facing view of evidence and messaging. Each theme was also voiced by leaders from several regions, and participants sharing a nationality differed in ways that matched their roles, suggesting a shared professional culture shaped by the school's international setting rather than any single national tradition. Because these findings rest on self-reports, they describe how administrators understood sustainability leadership rather than an independently measured level of competence.

3.2 Practices in Embedding the Sustainability Leadership Mindset

Using the seven domains as a priori categories, the analysis yielded seven themes and 21 categories describing how administrators reported embedding sustainability leadership in their units and across the school (Table 2).

**Table 2. Practices of School Administrators in Embedding Sustainability Leadership Mindset**

| Overarching Theme (Domain) | Category | Sample Excerpt |
|---|---|---|
| **Theme 1. Integrating Interconnected School Systems (Implementing Systems Thinking)** | 1.1 Interconnected Decision-Making and Holistic Educational Planning | P13 "It's not just about us within the school, but we also involve the families of our kids, of the students." "And we also get to connect with our external community, which is our families and also other, like, community engagement as well, like businesses around the community, partners around the community wherein we create that specific system within our school community." |
| | 1.2 Technology as a Sustainability Lever | P15 "I've led my teams through school ratings where they have improved. I've led schools through innovative practices where they've improved their technology infrastructure." |
| | 1.3 Multi-Domain Educational Benefits | P11 "It's also about ensuring that they build good habits as a Nibras student. Personal development is key. And then also, I think as a school, we are very cognizant that our decision, the sustainability really helps the school move forward." |

| Overarching Theme (Domain) | Category | Sample Excerpt |
|---|---|---|
| **Theme 2. Conducting Evidence-Informed, Stakeholder-Based Diagnosis (Diagnosing Sustainability Challenges)** | 2.1 Stakeholder-Based Needs Assessment | P07 "I take the department into consideration, each one person, one trainer from each department, sit with them, create a plan and then like, you know, they will train the other teachers in the department and then it goes into the students." P15 "And I think over time, when we look at the CEPH writing and when we look at each department CEPH as well and kind of see the gaps in the system and, you know, consult with a range of people, be it the administration, the heads of department, and teachers to come up with more solution-orientated focuses where we can kind of break down these concerns and come up with ideas or solutions that support the concern to be changed in a positive manner". |
| | 2.2 Data-Informed Identification of Sustainability Challenges | P10 "Okay first of all I gather feedback from the teachers, students and the parents and the staff. I have to review all the school data and observe school practices to identify the area that need improvement before planning a solution so to take a steps and to like to because this is the way how we will improve this initiative." |
| | 2.3 Balancing Operational Efficiency and Learning Quality | P09 "Sometimes an issue may appear straightforward on the surface, but as we speak to different stakeholders, we learn there are other factors at play. For instance, if we observe a problem with student engagement or a school program, we don't jump to a remedy. First, we collect information from instructors, students, and parents on their opinions." |
| **Theme 3. Building Shared Stakeholder Responsibility (Strengthening Stakeholder Collaboration)** | 3.1 Shared Responsibility among School Stakeholders | P06 "Okay, so again, really important, remember that the school is not an entity by itself. We can have the principal, teachers, administrative staff work together, but unless and until we have not involved the rest of our community, which involves students, parents, peers, guardians, ISP, we will not get the 360 feedback that we're really looking for." |
| | 3.2 Active Participation of Teachers, Students, and Parents | P03 "So with teachers and students, it's a bit easier because, I mean, we're here five days a week, so we get to keep that level of communication up, whether it is for students by posting information in their grade-level Google Classrooms about things to be mindful of to increase the sustainability. And same thing with teachers, sending out those emails, sending out that communication, and even talking about the small things…" |
| | 3.3 Institutional Mechanisms for Collaboration | P01 "And of course, parents support these initiatives through volunteer activities, community organizations, they can sometimes provide their expertise. So they can be coming to our school, they hold some regular meetings or workshops, collaborative projects toward the sustainability goal." |

| Overarching Theme (Domain) | Category | Sample Excerpt |
|---|---|---|
| **Theme 4. Communicating a Shared Sustainability Vision (Creating Shared Purpose and Vision)** | 4.1 Communication of a Shared Sustainability Vision | P01 "Okay, so actually, we consistently communicate sustainability as one of our core values during staff meetings, assemblies, orientation programs, and school events. But in fact, you can see them on the have those SDGs, right posted on our walls to just promote this initiative." |
| | 4.2 Visible Manifestations of Sustainability in School Culture | P05 "I believe this is something we're still working on. We are very, very well grounded as a whole school on our definition of learning and our torch values. When it comes to really thinking about it being part of our school culture and working for ISP, it really is now aligning our school culture, our values, our definition of learning alongside what our holding companies aspirations are." |
| | 4.3 Integration of Sustainability into Curriculum and Quality Education | P05 "Where learning first is our priority, where we're wanting to see high impact learning and that we all understand what that looks like, sounds like and feels like in the classroom. Where we consider what do students need to be empowered and to be able to learn out loud." |
| **Theme 5. Leading Collaborative, Data-Driven Strategic Planning (Co-Designing Sustainability Strategy)** | 5.1 Collaborative Development of Sustainability Strategies | P14 "Okay. So what I do is like, you know, I meet with the teachers and students and I brainstorm ideas. So what happens is like, when you brainstorm, I come up with an idea. I sit with my department. I sit with other departments. We all sit together." |
| | 5.2 Measurable Goals, Responsibilities, and Monitoring | P10 "To make sure this all has happened and it's accurate I work with the stakeholders to set the clear goals create achievable action plans. We have to actually create the action plan and we have to make sure it's achievable we are able to achieve this action plan and regularly monitor progress to ensure that the strategies meet the needs of the school community." |
| | 5.3 Evidence-Based Adjustment and Strategic Alignment | P11 "We do have teacher surveys, student surveys, and parent surveys that go out to understand how that strategy or that initiative has really impacted, or the perceived impact sometimes as well of that strategy. If it has worked, we keep that. We let it be for, you know, because of good practice." |
| **Theme 6. Amplifying Sustainability Stories and Recognition (Influencing and Storytelling)** | 6.1 Sharing Sustainability Success Stories | P01 "Okay, so we motivate stakeholders by sharing their stories that demonstrate positive impact of sustainability. Actually, in our school, we have this project exhibition. So we encourage, we celebrate their successful student led projects, we recognize teachers who implement some projects, the parents can witness them while the students confidently share how this project helps in terms of sustainability." |
| | 6.2 Recognition of Stakeholder Contributions | P03 "I do think it goes back to what I was saying before in terms of maybe like incentivizing them or having some type of like gamifying it or having a competition because it just, it would just increase that engagement." |

| Overarching Theme (Domain) | Category | Sample Excerpt |
|---|---|---|
| | 6.3 Communicating Sustainability Achievements to Stakeholders | P09 "At Nibras, we aim to properly communicate why a sustainability program is necessary and how it will benefit our students, school, and wider community. We also showcase and practice successful initiatives and achievements in assemblies, school activities, newsletters, and social media. When students and staff witness the good result of their efforts, they are more likely to want to join." |
| **Theme 7. Institutionalizing Policy-Grounded, Continuously Improving Practice (Embedding Sustainability Practices)** | 7.1 Integration of Sustainability into Institutional Policies and Operations | P09 "We want to embed sustainability into all parts of school life rather than considering it a distinct endeavor. We promote responsible practices through school programs, awareness initiatives, and community involvement in our daily operations." |
| | 7.2 Institutional Communication and Continuity of Sustainability Initiatives | P13 "Please ensure that sustainability initiatives continue beyond individual projects or leadership. So usually, so I think what works with Nibras is most of these ideas are also because students and even staff are given chances to make their own suggestions. So these suggestions, whether it's related to sustainability or anything, it usually does not come from leadership and then goes down to the students and the staff." |
| | 7.3 Evaluation, Feedback, and Continuous Improvement | P15 "And as teachers plan their units of inquiry, and as they plan the kind of cycle of or the route, I would say, of how that unit will evolve, they also need to kind of link it into a sustainable goal or a sustainable aspect. And what is the outcome or what is the purpose or what is the benefit to the students?" |

*Note.* P01–P15 = participant codes. Domain labels follow the seven sustainability leadership domains adapted from Thompson [14].

For systems thinking (Theme 1), administrators described interconnected decision-making that extended beyond the school to families, businesses, and community partners (P13), technology as a lever for improvement (P15), and the weighing of initiatives by their multiple educational benefits (P11). Diagnosis (Theme 2) was evidence-informed and stakeholder-based: administrators consulted departments and divisions (P07, P15), gathered feedback from teachers, students, parents, and staff and reviewed school data before planning solutions (P10), and resisted jumping to a remedy when an issue proved more complex than it first appeared (P09).

Collaboration (Theme 3) was framed as shared responsibility, since "the school is not an entity by itself" (P06), and was enacted through the participation of teachers, students, and parents and through mechanisms such as meetings, workshops, and volunteer activities (P01, P02, P03). An expressed belief in shared responsibility must, however, be distinguished from evidence that responsibility is actually shared, a distinction revisited in the teacher survey. Shared purpose and vision (Theme 4) were communicated through staff meetings, assemblies, orientation programs, and visible SDG displays (P01); aligned with the school's values and ISP aspirations, which one senior leader described as work "we're still working on" (P05); and integrated into curriculum and daily practice (P05, P09).

Co-designing strategy (Theme 5) involved brainstorming with teachers, students, and departments (P14), setting clear goals and achievable action plans with regular monitoring (P10), and using teacher, student, and parent surveys to decide which initiatives to keep (P11). Influencing and storytelling (Theme 6) relied on success stories showcased in project exhibitions (P01) and sport (P02), recognition through incentives and gamified

competition (P03) and Earth Day activities (P12), and communication of achievements through assemblies, newsletters, and social media (P09). Embedding (Theme 7) meant integrating sustainability "into all parts of school life rather than considering it a distinct endeavor" (P09), securing continuity beyond individual projects or leaders (P13), and linking units of inquiry to sustainability outcomes through evaluation and feedback (P15).

Taken together, the administrators described sustainability leadership as a set of interconnected institutional practices rather than isolated environmental initiatives, spanning planning, participation, communication, continuity, and improvement. The breadth of these accounts reflects the participants' professional remits: principals and department heads spoke to strategic direction and collaborative planning; inclusion, counseling, and safeguarding leaders to equitable participation and well-being; and data, ICT, athletics, and marketing leaders to evidence, technology, resource efficiency, and communication. Accounts of engaging families came from Filipino, Afghan, Egyptian, Romanian, and Jordanian participants, indicating that family engagement was valued across cultural traditions; the background the participants share is that of expatriate professionals in a UAE school. These are reported practices, which the study did not independently verify through observation, policy analysis, or longitudinal assessment.

3.3 Sustainability Practices for Quality Education (SDG 4)

The administrators' narratives on embedding sustainability practices yielded seven overarching themes, one per domain, and 35 categories (Table 3).

**Table 3. Sustainability Practices for Quality Education (SDG 4) Based on School Administrators' Narratives**

| Overarching Theme (Domain) | Category | Sample Excerpt |
|---|---|---|
| **Theme 1. Designing Holistic, Inclusive, and Data-Informed Learning (Implementing Systems Thinking)** | 1.1 Project-Based, Transdisciplinary, Exhibition-Style Learning | P09 "strengthened project-based learning through activities such as Exhibition Days and bringing these different elements together, we created a more meaningful learning experience and improved the overall quality of education" P13 "showcase American curriculum by highlighting hands-on learning and project-based activities rather than focusing only on examinations" |
| | 1.2 Dedicated Structures for Whole-Child/Well-Being Development | P03 "Implementing homeroom program that it was intentionally designed to be a space that can capture a wide range of topics for holistic learning" P15 "students need some kind of outlet to upskill themselves when it comes to learning skills and think beyond just the academics so derive that concept of the homeroom for students' well-being" |
| | 1.3 Systematic, Data-Informed Monitoring Across Multiple Indicators | P10 "I always look at several factors such as teaching strategies, attendance, students' well-being, and definitely parents' support; get feedback, we start reviewing it, and then we take our next step" P11 "monitor that use of data, introduced data meetings within our school from K to 12. And those data meetings really help teachers identify the gaps in learning plus the strengths" |
| | 1.4 Technology-Enabled Learning Platforms | P14 "not related to environmental sustainability goals, go paperless, created platforms like IXL or using things that facilitated working online" |

| Overarching Theme (Domain) | Category | Sample Excerpt |
|---|---|---|
| | 1.5 Individualized, Learner-Centered Inclusion | P08 “looked at the inclusion framework, and I decided I'm going to redesign it because I believe in the least restrictive environment; view learner as completely independent in the classroom” P01 “strengthening our literacy program for students by providing them meaningful learning platform” |
| **Theme 2. Identifying Resource, Contextual, and Conceptual Constraints (Diagnosing Sustainability Challenges)** | 2.1 Resource and Budget Constraints | P01 “limited resources, high usage of paper and energy, and ensuring continuous participation from students, staff, and parents in sustainability programs with increasing educational demand” P15 “going to come down to budget but teachers always find some kind of way around it, teachers are genuinely very passionate” |
| | 2.2 Sustaining Stakeholder Engagement and Continuity Amid Mobility | P09 “keeping consistent engagement from all stakeholders, especially in a varied and fast-changing community where children and families are from diverse origins” P07 “main challenge is the consistency, encouraging students to connect the dots between different disciplines; as different departments, we come together” |
| | 2.3 Navigating Emerging Technology | P08 “with the AI that’s happening now…teachers are flexible and adaptable” P11 “use of AI and just being able to monitor because our teachers are training our students to use it ethically and to be able to give it better prompts; still want students to cognitively come up with individual ideas and then use AI to refine them” |
| | 2.4 Environmental and Infrastructural Vulnerability | P05 “living in the UAE with this climate, the weather is definitely a challenge” |
| | 2.5 Conceptual Ambiguity About What Counts as a “Sustainability” Challenge | P04 “I can’t say that I see any connection between sustainability and the quality of education” |
| **Theme 3. Structuring Accountable, Cross-Boundary Collaboration (Strengthening Stakeholder Collaboration)** | 3.1 Structured, Recurring Collaborative Meeting Mechanisms | P11 “defined roles and responsibilities for everyone; have shared responsibility, communication becomes key” P15 “a meeting twice a week, which is called a collaborative meeting, and we kind of come up in that to discuss teaching and learning and solutions that provide the concept of quality education” |
| | 3.2 Differentiated, Clearly Defined Roles Across Stakeholder Groups | P01 “have regular communication and also share the planning sessions, teachers integrate sustainability, students participate, parents support and volunteer” P09 “giving different groups meaningful roles in school initiatives rather than simply asking them to participate; people have a clear role and responsibility, they become more invested in the success of the initiative” |
| | 3.3 Accountability as a Precondition for Effective Collaboration | P08 “planning without a timeline and people leads to no action” P11 “defined roles and responsibilities for everyone; have shared responsibility, communication becomes key; review and monitor to make sure that we have clear communication within the team” |

| Overarching Theme (Domain) | Category | Sample Excerpt |
|---|---|---|
| | 3.4 Cross-Disciplinary and Cross-Departmental Collaboration | P07 “really big is interdisciplinary and transdisciplinary projects; encouraging students to connect the dots between different disciplines” P14 “engage the entire school community, we need to celebrate achievements and recognize contributions from everyone—students, teachers, and anyone else” |
| | 3.5 Engaging External Stakeholders and Environmental Prompts | P01 “involve parents as well in their home reading activities” P02 “encourage shared responsibility by engaging teachers, parents, and students in sports and wellness initiatives. Collaboration ensures that physical education supports broader educational and sustainability goals” |
| **Theme 4. Reinforcing a Mission-Anchored, Participatory Vision (Creating Shared Purpose and Vision)** | 4.1 Anchoring Vision to Institutional Mission and Values | P09 “tie our sustainability efforts to our torch values and our mission” P05 “shared mission and vision where sustainability is a priority” |
| | 4.2 Multi-Channel, Recurring Communication to Reinforce Vision | P01 “communicate a clear vision that quality education and sustainability are interconnected through assemblies and newsletters; encourage all members of the school community to contribute ideas and participate in school and improvement initiatives” P02 “building a shared commitment to holistic education; value physical development equally with academics; reinforce commitment through events, campaigns, and regular communication” |
| | 4.3 Recognition and Incentives as Motivational Mechanisms | P03 “incentivizing it a bit more and just being able to give people a reason to put more effort into keeping sustainability at the forefront” P07 “we need to celebrate achievements and recognize contributions from everyone” |
| | 4.4 Co-Creating Vision Through Inclusive Stakeholder Involvement | P10 “make sure everyone is involved and accountable… the parents are our partners in success; take it from different perspectives” P11 “created it with all the stakeholders, you do get the buy in” |
| | 4.5 Uneven or Developmental Implementation of Shared Vision | P12 “in the beginning stages some committees functioned very tightly, others didn’t understand” P08 “use my diversity campaigns that I'm very passionate… didn’t get to do one this year because of the conflict” |
| **Theme 5. Co-Designing Evidence-Informed, Holistic Programs (Co-Designing Sustainability Strategy)** | 5.1 Collaborative, Role-Differentiated Participation | P01 “identify the school needs by reviewing educational data; design initiatives that improve teaching and learning; develop programs collaboratively, align them with our strategic goals” P02 “designing PE and sports programs with leadership and staff to ensure they improve students' learning outcomes” |
| | 5.2 Evidence-Informed, Quality-Focused Design | P01 “identify the school needs by reviewing educational data; design initiatives that improve teaching and learning; develop programs collaboratively, align them with our strategic goals, and evaluate them regularly” P12 “led the K-12 learning improvement process; ultimate outcome is students' progress and attainment results” |

| Overarching Theme (Domain) | Category | Sample Excerpt |
|---|---|---|
| | 5.3 Environmental Resource-Monitoring Tied to External Frameworks | P04 “monitoring the carbon footprint because ISP wants us to also monitor that so that it can be more sustainable; using different light bulbs that are less demanding of energy;” P05 “take part twice in reaching out to the ministry such as volunteered for schools on tree planting for Eco Warriors on the school premises” |
| | 5.4 Reorienting Toward Life Competencies and Holistic Development | P03 “ensuring that our school’s education remains holistic not narrow” P11 “develop programs that align or that are embedded within the life competencies; change with the context, but those skills will still remain is my participation in designing a program to improve school quality” |
| | 5.5 Personal, Consistent Integration of Sustainability Across Practice | P07 “I do it at every level, every one of my subject sustainability goal is implemented… co-curricular environmental club; meditation club and started with journaling” P03 “but that we are looking into the personal development of not only our students but also our staff as well” |
| **Theme 6. Mobilizing Stories, Relationships, and Recognition (Influencing and Storytelling)** | 6.1 Storytelling Through Concrete Student/Individual Growth Examples | P10 “share success stories and see this positive impact of sustainability initiatives such as through meetings, newsletters, assemblies, and social media to make sure we spread the spirit everywhere” P02 “use stories of student growth through sports to show how physical education improves confidence, discipline, and academic success” |
| | 6.2 Personal Relationship and Experience as Foundation for Influence | P08 “I want you to be committed it's going to be that that connection so I for me it's relationships I need to build a relationship” P15 “share those experiences with others because I'm very passionate about them; have empathy, you have the resilience, you have the grit, and you have the mindset that, you know, these are the kind of things that will change our thinking” |
| | 6.3 Formal Recognition and Peer Showcase Mechanisms | P14 “kudos program in our school where we like to appreciate teachers who have gone above and beyond their classrooms and are able to influence the students positively” P10 “share success stories and see this positive impact of sustainability initiatives such as through meetings, newsletters, assemblies, and social media” |
| | 6.4 Multi-Channel, Regularly Embedded Communication | P12 “weekly elementary overview that gets sent out where we might have nuggets of information being thrown to teachers; have more conversations about learning” P07 “students gave me a presentation and invited the community at large to come and witness the presentations” |
| | 6.5 Community-Facing Public Storytelling Events | P05 “storytelling becomes effective when people feel personally connected to the message; People are more likely to engage when they see themselves as part of the solution” |

| Overarching Theme (Domain) | Category | Sample Excerpt |
|---|---|---|
| **Theme 7. Sustaining Evaluated and Enduring Initiatives (Embedding Sustainability Practices)** | 7.1 Data-Driven, Multi-Source Evaluation | P01 "evaluate effectiveness clearly, need to conduct some surveys; ask for feedback from the students and all the stakeholders" P02 "evaluate effectiveness through student performance, participation rates, and behavioral improvements" |
| | 7.2 Behavioral and Attitudinal Indicators of Impact | P02 "evaluate effectiveness through student performance, participation rates, and behavioral improvements." P12 "triangulating evidence and data, looking at students' outcomes to assess their progress and attainment" |
| | 7.3 Institutionalization Through Continuity | P09 "check if the initiative continues beyond the first execution and whether it becomes part of the day-to-day practice; initiative that continues to bring value to students' learning and remains relevant to the requirements of the school community" P14 "becomes a part of Nibras tradition like the trash and show event" |
| | 7.4 Iterative, Feedback-Driven Improvement | P01 "evaluate effectiveness clearly, need to conduct some surveys; ask for feedback from the students and all the stakeholders; close monitoring and reflection are really vital to ensure that everyone is practicing it consistently" P10 "monitor students' outcomes, I gather the feedback from stakeholders, and I usually review program results and use the findings to improve and sustain success initiatives over time; always have to do the follow-up" |
| | 7.5 The Difficulty of Measuring Sustainability's Intangible Impact | P15 "that's really difficult, teacher has shown an interest and put it into their teaching philosophy or into a task for the students to do" |

*Note.* P01–P15 = participant codes. Categories resting on a single account or diverging from the general pattern (e.g., 2.5 and 7.5) were retained because they qualify the main findings.

For systems thinking, administrators designed holistic, inclusive, and data-informed learning (Theme 1): project-based, transdisciplinary Exhibition Days (P09, P13); a homeroom program dedicated to student well-being (P03, P15); K–12 data meetings and monitoring across attendance, well-being, teaching strategies, and parental support (P10, P11); paperless, technology-enabled platforms (P14); and an inclusion framework redesigned around the least restrictive environment (P08). Diagnosis (Theme 2) consisted mainly of constraints rather than practices: limited resources and high paper and energy use (P01, P15), sustaining engagement amid the mobility of a diverse community (P07, P09), the ethical use of artificial intelligence (P08, P11), and the UAE climate (P05). One divergent account, "I can't say that I see any connection between sustainability and the quality of education" (P04), revealed ambiguity about what counts as a sustainability challenge.

Collaboration (Theme 3) was structured and accountable, as seen in a twice-weekly collaborative meeting (P15), clearly defined roles for teachers, students, and parents (P01, P09), the recognition that "planning without a timeline and people leads to no action" (P08), interdisciplinary projects (P07), and partnerships with parents through home reading and wellness initiatives (P01, P02). The vision (Theme 4) was anchored to the school's mission and values (P05, P09), reinforced through assemblies, newsletters, and events (P01, P02), sustained through recognition and incentives (P03, P07), and co-created with stakeholders to secure buy-in (P10, P11), although implementation was uneven: some committees "functioned very tightly, others didn't understand" (P12), and one diversity campaign was interrupted by regional conflict (P08).

Co-design (Theme 5) involved data-informed, collaborative program development (P01, P02, P12), environmental monitoring such as carbon-footprint tracking prompted by ISP and ministry frameworks (P04, P05), a reorientation toward life competencies (P03, P11), and the personal integration of sustainability goals into subjects and clubs (P07). Influence (Theme 6) drew on stories of student growth (P02, P10), personal relationships (P08, P15), a "kudos" recognition program (P14), weekly updates (P12), and community-facing presentations (P05, P07). Embedding (Theme 7) relied on multi-source evaluation through surveys and student outcomes (P01, P02, P12), continuity as the mark of institutionalization, as when an initiative "becomes a part of Nibras tradition" (P14), and feedback-driven improvement (P01, P10), alongside an acknowledged difficulty in measuring the intangible impact of sustainability (P15).

These themes extend those reported in Section 3.2: integrated school systems appear as holistic, inclusive learning design; diagnosis appears as the specific constraints it revealed; shared responsibility takes the form of accountable, cross-boundary structures; and institutionalization is expressed through evaluation and endurance. Recognition appears under both Themes 4 and 6 because administrators described it both as a way to sustain commitment to the vision and as a means of influence. Several practices were reported by only one or two leaders, usually those directly responsible for them, and may therefore be less consistently visible to teachers, a possibility examined in Section 3.4. The clearest divergence (P04) did not reflect a regional pattern, since other participants from Arab countries described the link between sustainability and quality clearly. That all 15 administrators are expatriates may make them attentive to student and family mobility (P09), but it also makes leadership turnover a continuing risk to the institutional continuity that several participants named as the measure of sustainability.

### 3.4 Teachers' Perceived Extent of Implementation

Tables 4 to 10 present teachers' ratings for each domain, with indicators arranged from the highest to the lowest mean. Four interpretive points apply. First, the ratings are teachers' perceptions rather than observational measures of implementation. Second, the analysis is descriptive: the domain grand means fall within a narrow band (3.24–3.27), and their differences were not statistically tested. Third, because the verbal categories rest on fixed cutoffs, a difference of 0.01 (3.25 versus 3.26) can change the label. Fourth, on a 1–4 scale the largest possible standard deviation for a mean near 3.25 is about 1.30, so the observed values (0.85–1.16) represent considerable dispersion. Because every indicator was rated by the same 93 teachers, each mean–SD pair fixes the minimum number of teachers who chose each category: every indicator was rated Partially or Minimally Implemented by at least 8 to 18 teachers (about 9%–19%) and Fully Implemented by at least 40 to 57 teachers (about 43%–61%), and for 27 indicators the spread is too large to occur without at least one Minimally Implemented rating. A mean near 3.25 is therefore best read as the average of a large group of very favorable ratings and a smaller but recurring group of low ratings.

**Table 4. Extent of Implementation of Sustainability Practices on SDG 4: Implementing Systems Thinking**

| Indicator: My school administrators… | M | SD | V.I. |
|---|---|---|---|
| 1. Considers the interconnectedness of academic, social, emotional, and environmental learning outcomes in curriculum planning and review | 3.28 | 0.94 | Fully Implemented |
| 2. Integrates digital tools and technology platforms to support more holistic and transdisciplinary learning experiences | 3.26 | 0.98 | Fully Implemented |
| 3. Uses learning observations and collaborative feedback regularly to improve instructional practices | 3.26 | 0.99 | Fully Implemented |
| 4. Creates school programs that encourage students to develop competencies beyond academics, including collaboration, creativity, and problem-solving | 3.26 | 1.00 | Fully Implemented |
| 5. Implements inclusive education practices consistently to address the diverse needs of all learners | 3.26 | 1.07 | Fully Implemented |
| 6. Promotes multilingual and multicultural integration in learning to create an inclusive environment that reflects the diversity of the school community | 3.26 | 1.08 | Fully Implemented |

| Indicator: My school administrators… | M | SD | V.I. |
|---|---|---|---|
| 7. Initiates activities that are coordinated across grade levels to ensure continuity and alignment of learning experiences | 3.25 | 0.89 | Substantially Implemented |
| 8. Recognizes how decisions in one area of the school (e.g., curriculum, operations, staffing) affect outcomes in other areas | 3.25 | 0.93 | Substantially Implemented |
| 9. Integrates transdisciplinary and project-based learning to address real-world sustainability issues | 3.25 | 1.00 | Substantially Implemented |
| 10. Makes decisions based on multiple sources of data, including student performance, well-being, attendance, and teacher feedback | 3.25 | 1.11 | Substantially Implemented |
| **Grand Mean** | **3.26** | **–** | **Fully Implemented** |

*Note.* M = Mean; SD = Standard Deviation; V.I. = Verbal Interpretation. Legend: 3.26–4.00 Fully Implemented; 2.51–3.25 Substantially Implemented; 1.76–2.50 Partially Implemented; 1.00–1.75 Minimally Implemented. n = 93 teachers. Indicators are arranged from the highest to the lowest mean; equal means are ranked from the lower to the higher SD.

Implementing Systems Thinking obtained a grand mean of 3.26 (Fully Implemented), with six indicators rated Fully Implemented and four Substantially Implemented (Table 4). Considering the interconnectedness of academic, social, emotional, and environmental outcomes in curriculum planning was rated highest (Item 1, M = 3.28, SD = 0.94). Teachers agreed most on cross-grade coordination (Item 7, SD = 0.89) and least on inclusive education (Item 5, SD = 1.07), multilingual integration (Item 6, SD = 1.08), and data-based decisions (Item 10, SD = 1.11); spreads of this size imply that at least 7 to 9 teachers (about 8%–10%) rated each of these three practices Minimally Implemented, so they appear more visible to some teachers than to others. The Fully Implemented label should also be read with care, because the unrounded grand mean (3.258) reaches the category only after rounding. The strong rating on Item 1 is consistent with UNESCO's [15] view that leaders influence the interconnected parts of schooling when they hold decision-making authority, while the comparatively lower rating on multi-source, data-based decisions echoes findings that sustainability awareness does not always carry over into coordinated institutional practice [17], [54], [55].

**Table 5. Extent of Implementation of Sustainability Practices on SDG 4: Diagnosing Sustainability Challenges**

| Indicator: My school administrators… | M | SD | V.I. |
|---|---|---|---|
| 1. Uses evidence from monitoring and evaluation to diagnose root causes of school challenges before implementing solutions | 3.28 | 0.85 | Fully Implemented |
| 2. Analyzes factors influencing student attendance, engagement, and well-being to improve educational outcomes | 3.27 | 0.93 | Fully Implemented |
| 3. Identifies risks that may affect the continuity and long-term success of sustainability programs and school projects | 3.26 | 0.92 | Fully Implemented |
| 4. Regularly identifies the barriers that affect students' access to equitable and quality learning opportunities | 3.26 | 0.98 | Fully Implemented |
| 5. Gathers feedback from teachers, students, parents, and other stakeholders to identify emerging educational challenges | 3.26 | 0.98 | Fully Implemented |
| 6. Assesses teachers' professional development needs before implementing new educational initiatives or technologies | 3.25 | 0.86 | Substantially Implemented |
| 7. Monitors the efficient use of school resources (e.g., paper, energy, technology, and budget) to support sustainable operations | 3.24 | 0.91 | Substantially Implemented |
| 8. Evaluates the impact of student diversity, mobility, and changing community needs when planning school improvement initiatives | 3.23 | 0.93 | Substantially Implemented |

| Indicator: My school administrators… | M | SD | V.I. |
|---|---|---|---|
| 9. Identifies environmental and infrastructure-related challenges (e.g., extreme weather, facility limitations) that may affect the learning environment | 3.23 | 1.01 | Substantially Implemented |
| 10. Recognizes teachers' confidence and self-efficacy as a factor affecting the successful implementation of sustainability initiatives | 3.22 | 0.99 | Substantially Implemented |
| **Grand Mean** | **3.25** | **–** | **Substantially Implemented** |

*Note.* M = Mean; SD = Standard Deviation; V.I. = Verbal Interpretation. Legend: 3.26–4.00 Fully Implemented; 2.51–3.25 Substantially Implemented; 1.76–2.50 Partially Implemented; 1.00–1.75 Minimally Implemented. n = 93 teachers. Indicators are arranged from the highest to the lowest mean; equal means are ranked from the lower to the higher SD.

Diagnosing Sustainability Challenges obtained a grand mean of 3.25 (Substantially Implemented), with five indicators in each category (Table 5). Using monitoring and evaluation evidence to diagnose root causes before implementing solutions was rated highest and had the narrowest spread of all 70 indicators (Item 1, M = 3.28, SD = 0.85), whereas recognizing teachers' confidence and self-efficacy was rated lowest (Item 10, M = 3.22, SD = 0.99). The strong rating for evidence-based diagnosis fits the decision-making competencies emphasized in the literature [48], [49], [51]. The lower ratings for evaluating student diversity and mobility (Item 8) and teacher self-efficacy (Item 10) are consistent with reports that educators' awareness of sustainability is applied only partially in practice [20], [56], a gap traced to resource limitations, workload, and inadequate professional development rather than a lack of awareness [17], [18]. Atena's [19] observation that leaders' self-perceptions may differ from stakeholders' evaluations is also pertinent.

**Table 6. Extent of Implementation of Sustainability Practices on SDG 4: Strengthening Stakeholder Collaboration**

| Indicator: My school administrators… | M | SD | V.I. |
|---|---|---|---|
| 1. Fosters interdisciplinary and transdisciplinary collaboration to enhance teaching, learning, and sustainability education | 3.28 | 0.97 | Fully Implemented |
| 2. Encourages open communication that values diverse perspectives in school decision-making | 3.27 | 1.03 | Fully Implemented |
| 3. Aligns the school's formal appraisal and observation processes with the organization's broader goals | 3.27 | 1.07 | Fully Implemented |
| 4. Regularly monitors and evaluates collaborative initiatives to strengthen collective accountability and continuous improvement | 3.26 | 0.92 | Fully Implemented |
| 5. Promotes shared responsibility among teachers, students, parents, and community partners in achieving the school's educational and sustainability goals | 3.25 | 1.01 | Substantially Implemented |
| 6. Ensures that school teams have clearly defined roles, responsibilities, and timelines when implementing sustainability initiatives | 3.25 | 1.03 | Substantially Implemented |
| 7. Supports collaborative problem-solving to address educational and sustainability-related challenges | 3.24 | 1.05 | Substantially Implemented |
| 8. Provides regular opportunities for collaborative planning, communication, and feedback among school stakeholders | 3.23 | 0.99 | Substantially Implemented |
| 9. Encourages teachers to share best practices through professional learning communities, peer observations, and collaborative discussions | 3.23 | 1.16 | Substantially Implemented |
| 10. Uses visual reminders and campus-wide displays (e.g., signage, posters) to reinforce and sustain stakeholders' collective commitment to sustainability goals | 3.22 | 1.04 | Substantially Implemented |

| Indicator: My school administrators… | M | SD | V.I. |
|---|---|---|---|
| **Grand Mean** | **3.25** | **–** | **Substantially Implemented** |

*Note.* M = Mean; SD = Standard Deviation; V.I. = Verbal Interpretation. Legend: 3.26–4.00 Fully Implemented; 2.51–3.25 Substantially Implemented; 1.76–2.50 Partially Implemented; 1.00–1.75 Minimally Implemented. n = 93 teachers. Indicators are arranged from the highest to the lowest mean; equal means are ranked from the lower to the higher SD.

Strengthening Stakeholder Collaboration obtained a grand mean of 3.25 (Substantially Implemented), with four indicators rated Fully Implemented and six Substantially Implemented (Table 6). Fostering interdisciplinary and transdisciplinary collaboration was rated highest (Item 1, M = 3.28, SD = 0.97) and the use of visual reminders and campus-wide displays lowest (Item 10, M = 3.22, SD = 1.04). This domain produced the most divided perceptions: its standard deviations ranged from 0.92 to 1.16, and seven of its ten indicators exceeded 1.00. Encouraging teachers to share best practices through professional learning communities and peer observation had the widest spread of all 70 indicators (Item 9, M = 3.23, SD = 1.16), which implies that at least 12 teachers (about 13%) selected Minimally Implemented while at least 57 (about 61%) selected Fully Implemented. Because the high-SD items concern practices that teachers experience within their own teams, collaboration may be strong in some teams and weaker in others. The rating on fostering interdisciplinary collaboration matches Atena's [19] description of leaders who bring teachers into reform, and Karia [57] identified such adaptive, collaborative work as a defining trait of sustainable leadership. Yet although the shared decision-making structures described by Kilag et al. [13] may be in place, they do not appear to reach every part of the school with the same consistency, in contrast with administrators' accounts of collaboration as central to how the school functions. As Weiss et al. [58] noted, embedding sustainability requires leaders to actively drive collaboration rather than assume it will follow once initiatives are announced.

**Table 7. Extent of Implementation of Sustainability Practices on SDG 4: Creating Shared Purpose and Vision**

| Indicator: My school administrators… | M | SD | V.I. |
|---|---|---|---|
| 1. Uses regular communication channels (e.g., assemblies, newsletters, meetings, websites, or campaigns) to reinforce the school's sustainability vision | 3.29 | 0.89 | Fully Implemented |
| 2. Fosters a school culture where every stakeholder feels responsible for achieving the school's sustainability vision | 3.29 | 0.90 | Fully Implemented |
| 3. Explicitly connects sustainability initiatives to the school's core mission, vision, and values to strengthen institutional identity and commitment | 3.29 | 0.94 | Fully Implemented |
| 4. Encourages stakeholders to understand how sustainability initiatives contribute to improved student learning and well-being | 3.27 | 0.92 | Fully Implemented |
| 5. Uses incentives and rewards to motivate stakeholders' active participation in and commitment to the school's sustainability vision | 3.26 | 0.87 | Fully Implemented |
| 6. Recognizes and celebrates the contributions of teachers, students, parents, and staff in advancing the school's sustainability goals | 3.26 | 0.93 | Fully Implemented |
| 7. Ensures that all departments understand and work toward the same sustainability and educational priorities | 3.26 | 0.95 | Fully Implemented |
| 8. Involves teachers, students, parents, and other stakeholders in developing and refining the school's sustainability vision | 3.26 | 0.97 | Fully Implemented |
| 9. Communicates a clear vision that integrates sustainability with the school's commitment to quality education | 3.26 | 1.04 | Fully Implemented |
| 10. Encourages teachers to exercise creativity and innovation while working toward the school's shared educational and sustainability goals | 3.25 | 1.00 | Substantially Implemented |

| Indicator: My school administrators… | M | SD | V.I. |
|---|---|---|---|
| **Grand Mean** | **3.27** | **–** | **Fully Implemented** |

*Note.* M = Mean; SD = Standard Deviation; V.I. = Verbal Interpretation. Legend: 3.26–4.00 Fully Implemented; 2.51–3.25 Substantially Implemented; 1.76–2.50 Partially Implemented; 1.00–1.75 Minimally Implemented. n = 93 teachers. Indicators are arranged from the highest to the lowest mean; equal means are ranked from the lower to the higher SD.

Creating Shared Purpose and Vision obtained the highest grand mean (3.27, Fully Implemented), with nine of ten indicators rated Fully Implemented (Table 7); its unrounded grand mean (3.269) does not depend on rounding for its classification. Using regular communication channels, fostering a culture of shared responsibility, and explicitly connecting initiatives to the school's mission and values shared the highest mean (Items 1–3, M = 3.29). Teachers agreed closely that communication channels are used (Item 1, SD = 0.89) but were more divided on whether a clear, integrated vision is communicated (Item 9, SD = 1.04), suggesting that the frequency of communication is experienced more consistently than the clarity of its message. Encouraging teachers' creativity and innovation was the only Substantially Implemented indicator (Item 10, M = 3.25). Because this domain exceeds the lowest by only 0.03, the difference is descriptive. Sustained communication may be helping to close the gap between general and in-depth SDG understanding documented elsewhere [20], [54], [55], while the lower rating on innovation indicates room to translate the shared vision into more innovative practice.

**Table 8. Extent of Implementation of Sustainability Practices on SDG 4: Co-Designing Sustainability Strategy**

| Indicator: My school administrators… | M | SD | V.I. |
|---|---|---|---|
| 1. Ensures that sustainability-related programs are designed to align with the broader UAE educational context | 3.29 | 0.95 | Fully Implemented |
| 2. Integrates sustainability concepts into classroom instruction, co-curricular activities, and student development programs | 3.28 | 0.93 | Fully Implemented |
| 3. Ensures that sustainability strategies are aligned with the school's mission, strategic goals, and curriculum | 3.26 | 0.93 | Fully Implemented |
| 4. Uses school data and identified needs to collaboratively design sustainability initiatives that improve teaching and learning | 3.25 | 0.92 | Substantially Implemented |
| 5. Designs sustainability initiatives that address students' academic, social, emotional, and environmental learning needs | 3.24 | 0.91 | Substantially Implemented |
| 6. Promotes responsible management of school resources, including energy, materials, and environmental practices, when designing sustainability programs | 3.24 | 0.93 | Substantially Implemented |
| 7. Collaborates with different school teams to implement and monitor sustainability initiatives effectively | 3.22 | 0.92 | Substantially Implemented |
| 8. Adapts sustainability strategies based on stakeholder feedback, changing school needs, and emerging educational priorities | 3.22 | 0.92 | Substantially Implemented |
| 9. Engages with government bodies (e.g., Ministry-led environmental programs) to support the implementation of the school's sustainability initiatives | 3.22 | 0.93 | Substantially Implemented |
| 10. Encourages innovative and context-responsive approaches when developing sustainability programs | 3.20 | 1.01 | Substantially Implemented |
| **Grand Mean** | **3.24** | **–** | **Substantially Implemented** |

*Note.* M = Mean; SD = Standard Deviation; V.I. = Verbal Interpretation. Legend: 3.26–4.00 Fully Implemented; 2.51–3.25 Substantially Implemented; 1.76–2.50 Partially Implemented; 1.00–1.75 Minimally Implemented. n = 93 teachers. Indicators are arranged from the highest to the lowest mean; equal means are ranked from the lower to the higher SD.

Co-Designing Sustainability Strategy obtained the lowest grand mean (3.24, Substantially Implemented), with three indicators rated Fully Implemented and seven Substantially Implemented (Table 8). Aligning programs with the broader UAE educational context was rated highest (Item 1, M = 3.29, SD = 0.95), consistent with Francisco and Nuqui's [59] emphasis on adaptive leadership and sound decision-making, while encouraging innovative and context-responsive approaches obtained the lowest mean in the entire dataset (Item 10, M = 3.20, SD = 1.01). Apart from Item 10, the standard deviations fell within a narrow band (0.91–0.95), so the domain's lower rating reflects a judgment broadly shared by teachers rather than the views of a few. Administrators described co-design and strategic planning as important practices, yet teachers perceived less consistent implementation, echoing the difficulty of sustaining genuinely participatory strategy development. Kilag et al. [13] emphasized that holistic, teacher-supportive systems rather than top-down planning sustain strategy implementation, and others have stressed that integrating sustainability goals requires ongoing institutional support [21], [47] and decision-oriented frameworks for continual refinement [22], [52].

**Table 9. Extent of Implementation of Sustainability Practices on SDG 4: Influencing and Storytelling**

| Indicator: My school administrators… | M | SD | V.I. |
|---|---|---|---|
| 1. Implements a formal recognition or "kudos" program that celebrates teachers who model sustainability leadership and provides opportunities for them to share learning from external professional development with the school community | 3.27 | 1.00 | Fully Implemented |
| 2. Shares authentic success stories that demonstrate the positive impact of sustainability initiatives on student learning and school improvement | 3.26 | 0.93 | Fully Implemented |
| 3. Uses real-life examples from the school community to illustrate how sustainability contributes to quality education | 3.26 | 0.94 | Fully Implemented |
| 4. Highlights the achievements of students, teachers, and staff on various platforms (e.g., assemblies, newsletters, meetings, and social media) to encourage wider participation in sustainability initiatives | 3.26 | 0.97 | Fully Implemented |
| 5. Fosters meaningful relationships that encourage teachers, students, parents, and staff to actively support sustainability initiatives | 3.26 | 0.99 | Fully Implemented |
| 6. Communicates the purpose, expected outcomes, and progress of sustainability initiatives clearly and transparently | 3.25 | 0.89 | Substantially Implemented |
| 7. Communicates sustainability messages in ways that encourage stakeholders to feel personally connected to the school's vision and goals | 3.24 | 0.89 | Substantially Implemented |
| 8. Encourages teachers and students to share their experiences and best practices to inspire continuous learning and innovation | 3.24 | 1.02 | Substantially Implemented |
| 9. Establishes recurring school traditions or signature events (e.g., student showcases, exhibitions) that engage the wider community in celebrating sustainability efforts | 3.23 | 0.97 | Substantially Implemented |
| 10. Promotes hands-on learning experiences that help students understand and communicate the value of sustainability | 3.23 | 0.98 | Substantially Implemented |
| **Grand Mean** | **3.25** | **–** | **Substantially Implemented** |

*Note.* M = Mean; SD = Standard Deviation; V.I. = Verbal Interpretation. Legend: 3.26–4.00 Fully Implemented; 2.51–3.25 Substantially Implemented; 1.76–2.50 Partially Implemented; 1.00–1.75 Minimally Implemented. n = 93 teachers. Indicators are arranged from the highest to the lowest mean; equal means are ranked from the lower to the higher SD.

 

Influencing and Storytelling obtained a grand mean of 3.25 (Substantially Implemented), with five indicators in each category (Table 9). A formal recognition or "kudos" program was rated highest (Item 1, M = 3.27, SD = 1.00), although its spread implies that at least two teachers rated it Minimally Implemented; the program appears visible to most teachers but not to all. Recurring signature events (Item 9) and hands-on learning experiences (Item 10) were rated lowest (M = 3.23 each). Teachers agreed closely on how sustainability is communicated (Items 6 and 7, SD = 0.89) but differed more on how consistently teachers and students share experiences and best practices (Item 8, SD = 1.02), echoing the pattern for sharing best practices in Table 6. These results are consistent with literature linking leaders' communication to stakeholders' attitudes toward sustainability [23], [18], [53], [24] and suggest that storytelling could become a more sustained institutional habit, supported by community involvement [60] and communication grounded in interdependence [16].

**Table 10. Extent of Implementation of Sustainability Practices on SDG 4: Embedding Sustainability Practices**

| Indicator: My school administrators… | M | SD | V.I. |
|---|---|---|---|
| 1. Encourages teachers, students, parents, and staff to consistently practice sustainability in their daily activities | 3.27 | 0.90 | Fully Implemented |
| 2. Promotes continuous reflection and follow-up to sustain the implementation of sustainability initiatives | 3.27 | 0.91 | Fully Implemented |
| 3. Integrates sustainability principles into school policies, teaching practices, and daily school operations | 3.26 | 0.92 | Fully Implemented |
| 4. Provides ongoing support and opportunities for stakeholders to strengthen their commitment to sustainability as part of the school's culture | 3.26 | 0.92 | Fully Implemented |
| 5. Ensures that successful sustainability initiatives become part of the school's long-term programs, traditions, and organizational practices | 3.26 | 0.97 | Fully Implemented |
| 6. Uses both quantitative and qualitative data to determine the effectiveness of sustainability initiatives and guide continuous improvement | 3.24 | 0.91 | Substantially Implemented |
| 7. Establishes a dedicated sustainability committee or support structure that staff can consistently refer to for guidance on sustainability initiatives | 3.24 | 0.91 | Substantially Implemented |
| 8. Establishes clear success indicators to assess whether sustainability initiatives achieve their intended educational and organizational outcomes | 3.24 | 0.93 | Substantially Implemented |
| 9. Reviews sustainability initiatives and retains those perceived to be successful, discontinuing those that could not be implemented effectively | 3.24 | 0.98 | Substantially Implemented |
| 10. Evaluates sustainability initiatives based on their long-term impact on student learning, well-being, and school improvement | 3.23 | 0.93 | Substantially Implemented |
| **Grand Mean** | **3.25** | **–** | **Substantially Implemented** |

*Note.* M = Mean; SD = Standard Deviation; V.I. = Verbal Interpretation. Legend: 3.26–4.00 Fully Implemented; 2.51–3.25 Substantially Implemented; 1.76–2.50 Partially Implemented; 1.00–1.75 Minimally Implemented. n = 93 teachers. Indicators are arranged from the highest to the lowest mean; equal means are ranked from the lower to the higher SD.

Embedding Sustainability Practices obtained a grand mean of 3.25 (Substantially Implemented; unrounded 3.251), with five indicators in each category (Table 10). Encouraging consistent daily practice (Item 1) and promoting continuous reflection and follow-up (Item 2) were rated highest (M = 3.27 each), whereas evaluating initiatives by their long-term impact on learning, well-being, and school improvement was rated lowest (Item 10, M = 3.23, SD = 0.93). This domain had the narrowest range of standard deviations (0.90–0.98), and its lowest-rated item can be produced without any Minimally Implemented ratings, so its lower mean reflects a broadly shared reservation rather than a few very low scores. The stronger ratings support descriptions of leaders building sustainability into institutional life and planning [21], [61], [62] and the importance of aligning strategy, classroom

 

practice, and professional learning [25], [22], [26]. The lower rating on long-term impact reflects the persistent gap between awareness and institutional practice [56], [63], which Bartolome et al. [18] traced to limited funding, administrative support, and competing academic demands.

**Table 11. Extent of Implementation of Sustainability Practices on SDG 4 Across the Seven Sustainability Leadership Domains**

| Domain | Grand Mean | V.I. |
|---|---|---|
| 1. Creating Shared Purpose and Vision | 3.27 | Fully Implemented |
| 2. Implementing Systems Thinking | 3.26 | Fully Implemented |
| 3. Diagnosing Sustainability Challenges | 3.25 | Substantially Implemented |
| 4. Strengthening Stakeholder Collaboration | 3.25 | Substantially Implemented |
| 5. Influencing and Storytelling | 3.25 | Substantially Implemented |
| 6. Embedding Sustainability Practices | 3.25 | Substantially Implemented |
| 7. Co-Designing Sustainability Strategy | 3.24 | Substantially Implemented |
| **Overall** | **3.25** | **Substantially Implemented** |

*Note.* V.I. = Verbal Interpretation. Domains are arranged from the highest to the lowest grand mean. Unrounded grand means: Implementing Systems Thinking, 3.258; Embedding Sustainability Practices, 3.251; Creating Shared Purpose and Vision, 3.269.

Across the seven domains (Table 11), the grand means ranged from 3.24 to 3.27, with an overall grand mean of 3.25 (Substantially Implemented). Of the 70 indicators, 37 were rated Fully Implemented and 33 Substantially Implemented; item means ranged from 3.20 to 3.29, and no indicator mean fell in the two lower categories. Because many item means lie on either side of the 3.25–3.26 cutoff, the 37–33 split should be read with caution, and the favorable overall picture exists alongside a recurring minority of teachers who perceived the practices as weakly implemented. Consistent with the literature [15], [18], [13], [17], the results suggest that sustainability awareness and leadership practice are present but require deliberate structures, communication, and participatory strategy work to take hold consistently. Turning the shared vision into innovative, participatory, and well-diagnosed action is where the school has the most room to grow.

3.5 Integration of Qualitative and Quantitative Findings

Table 12 integrates the two datasets by domain. Because the qualitative data came from administrators and the quantitative data from teachers, divergence is interpreted as a possible perception gap between leaders and implementers rather than as a contradiction. Creating Shared Purpose and Vision showed convergence: administrators' emphasis on a communicated, embedded vision corresponds with the highest teacher rating. Strengthening Stakeholder Collaboration showed partial divergence: administrators strongly emphasized shared responsibility, but teachers rated regular opportunities for collaborative planning (Item 8) and the sharing of best practices (Item 9) at M = 3.23, and Item 9 showed the widest dispersion of all indicators. Co-Designing Sustainability Strategy showed the most pronounced partial divergence: administrators articulated collaborative, data-driven planning, yet teachers gave this domain the lowest grand mean. Since the domain means differ by only 0.03, these patterns are interpreted as relative tendencies rather than large differences.

**Table 12. Integration of Qualitative and Quantitative Findings**

| Domain and Theme | Qualitative Finding (Administrators) | Quantitative Finding (Teachers) | Integration | Implication |
|---|---|---|---|---|
| **Creating Shared Purpose and Vision Theme 4. Reinforcing a Mission-Anchored, Participatory Vision** | Administrators anchored the vision to the school's mission and values (4.1), reinforced it through multi-channel, recurring communication (4.2), sustained commitment through recognition and incentives (4.3), and co-created it with stakeholders (4.4). Uneven uptake across committees and an interrupted campaign showed that implementation was still developing (4.5). | M = 3.27 (Fully Implemented), the highest of the seven domains; SD = 0.87–1.04; highest: Items 1, 2, and 3 (M = 3.29); lowest: Item 10 (M = 3.25). | Convergence. Both datasets show a vision that is communicated and shared, although Category 4.5 indicates that understanding is not yet uniform across committees. | Maintain and institutionalize the vision through mission documents and regular channels and target any departments or committees where understanding is uneven. |
| **Implementing Systems Thinking Theme 1. Designing Holistic, Inclusive, and Data-Informed Learning** | Administrators designed project-based, transdisciplinary learning (1.1), created dedicated structures for well-being (1.2), monitored learning across multiple indicators (1.3), adopted technology-enabled learning platforms (1.4), and redesigned inclusion around individual learners (1.5). | M = 3.26 (Fully Implemented); SD = 0.89–1.11; highest: Item 1 (M = 3.28); lowest: Items 7, 8, 9, and 10 (M = 3.25). | Convergence. Both datasets show that systems-oriented practices are present and consistently perceived. | Sustain and formalize the systems approach by building it into planning cycles and documents. |
| **Diagnosing Sustainability Challenges Theme 2. Identifying Resource, Contextual, and Conceptual Constraints** | Administrators identified resource and budget constraints (2.1), the difficulty of sustaining engagement amid mobility (2.2), emerging technology (2.3), and climate-related vulnerability (2.4). One participant saw no link between sustainability and educational quality (2.5), and concerns about AI and teacher readiness were raised by only two participants. | M = 3.25 (Substantially Implemented); SD = 0.85–1.01; highest: Item 1 (M = 3.28); lowest: Item 10 (M = 3.22). | Partial convergence. Diagnosis is practiced, but unevenly across items and participants. | Strengthen diagnostic capability, especially in assessing teacher readiness and identifying root causes. |
| **Strengthening Stakeholder Collaboration Theme 3. Structuring Accountable, Cross-Boundary Collaboration** | Administrators described structured, recurring collaborative meetings (3.1), clearly defined roles across stakeholder groups (3.2), and accountability as a precondition for collaboration (3.3), together with cross-departmental projects (3.4) and the engagement of parents and external partners (3.5). | M = 3.25 (Substantially Implemented); SD = 0.92–1.16; widest spread: Item 9 (M = 3.23, SD = 1.16); lowest: Item 10 (M = 3.22). | Partial divergence. Administrators describe strong shared responsibility, while survey respondents are split on how consistently it is experienced. This may reflect a leader–teacher perception gap. | Strengthen structured collaboration by clarifying roles, timelines, and accountability, and check whether the practice reaches all teachers. |
| **Influencing and Storytelling Theme 6. Mobilizing Stories, Relationships, and Recognition** | Administrators shared stories of concrete student growth (6.1), built influence through relationships and personal experience (6.2), used formal recognition such as the "kudos" program (6.3), communicated through regular, multi-channel updates (6.4), and held community-facing events (6.5). | M = 3.25 (Substantially Implemented); SD = 0.89–1.02; highest: Item 1 (M = 3.27); lowest: Items 9 and 10 (M = 3.23). | Convergence. Both datasets show that communication and recognition are prominent. | Sustain current practice and formalize it where items are lowest, for example through a recurring recognition program and signature showcase events. |

| Domain and Theme | Qualitative Finding (Administrators) | Quantitative Finding (Teachers) | Integration | Implication |
|---|---|---|---|---|
| **Embedding Sustainability Practices Theme 7. Sustaining Evaluated and Enduring Initiatives** | Administrators evaluated initiatives through multiple sources (7.1) and behavioral and attitudinal indicators (7.2), treated continuity as the mark of institutionalization (7.3), and refined initiatives through feedback (7.4). One administrator found the intangible impact of sustainability difficult to measure (7.5). | M = 3.25 (Substantially Implemented); SD = 0.90–0.98; highest: Items 1 and 2 (M = 3.27); lowest: Item 10 (M = 3.23). | Partial convergence. Embedding is practiced, but the administrators' own difficulty with measurement suggests monitoring is the weaker element. | Strengthen monitoring by setting explicit success indicators and a review cycle, and secure continuity through policy embedding and a dedicated support structure. |
| **Co-Designing Sustainability Strategy Theme 5. Co-Designing Evidence-Informed, Holistic Programs** | Administrators described collaborative, role-differentiated participation (5.1) and evidence-informed, quality-focused design (5.2), with some leading and others supporting. Environmental monitoring was often prompted by ISP or ministry frameworks rather than internal co-design (5.3), and programs were oriented toward life competencies (5.4) and personal practice (5.5). | M = 3.24 (Substantially Implemented), the lowest of the seven domains; SD = 0.91–1.01; highest: Item 1 (M = 3.29); lowest: Item 10 (M = 3.20). | Partial divergence. Administrators describe participatory design, while teachers rate their experience of it lowest. This may reflect a leader–teacher perception gap: planning that feels collaborative to those who lead it may not feel co-designed to those who implement it. | Strengthen teachers' entry points into program design (representation on planning teams, feedback cycles) and distinguish externally mandated monitoring from school-initiated design. |

*Note.* Numbers in parentheses in the qualitative column refer to the categories in Table 3. Item numbers in the quantitative column refer to Tables 4 to 10.

### 3.6 Recommended Program: "Leading the Class of Change"

Drawing on the integrated findings, the study proposes a Sustainability Leadership Capability Program for the school's administrators. Its title, "Leading the Class of Change," is taken from the ISP annual sustainability report, The Class of Change: From Commitment to Action. The rationale rests on the teachers' overall rating of 3.25 (Substantially Implemented), with 37 indicators rated Fully Implemented and 33 Substantially Implemented, which indicates that sustainability leadership practices are established but require more consistent implementation. The qualitative findings revealed the administrators' commitment to interconnected, long-term, and continuously improving leadership alongside constraints in resources, stakeholder mobility, emerging technology, environmental and infrastructural vulnerability, conceptual ambiguity, uneven vision implementation, limited parent and community engagement, and the measurement of intangible outcomes, which together underscore the need for strategic rather than reactive leadership.

The program's general objective is to enhance the administrators' sustainability leadership practices so that they contribute consistently to quality education in line with SDG 4. Its specific objectives are to (a) strengthen the co-design of sustainability strategy through data-informed, innovative, and context-responsive program development with teachers, students, parents, and government partners; (b) build diagnostic practices that consider teacher self-efficacy, professional development needs, student diversity and mobility, resource use, and environmental risks; (c) establish structured and consistent collaboration mechanisms with clearly defined roles, including stronger participation of parents and the wider community; (d) institutionalize sustainability through a dedicated support structure, clear success indicators, and a systematic review of initiatives for long-term impact; (e) deepen influence through transparent communication, hands-on student learning, and recurring community events; (f) reinforce systems thinking through cross-grade alignment and decisions informed by multiple sources of data; and (g) sustain the shared vision while giving teachers greater room for creativity and innovation.

 

Each module's priority was set by triangulating the domain grand mean, the number of Substantially Implemented indicators, the lowest item means and widest standard deviations, and the qualitative evidence (Table 13). Co-Designing Sustainability Strategy, Diagnosing Sustainability Challenges, and Strengthening Stakeholder Collaboration were assigned the highest priority.

**Table 13. Triangulation of Findings and Priority Level of Each Program Module**

| Domain / Module | Grand Mean (V.I.) | Indicators Rated SI | Lowest Item Mean / Widest SD | Qualitative Evidence | Priority |
|---|---|---|---|---|---|
| **Creating Shared Purpose and Vision** | 3.27 (FI) | 1 of 10 | Item 10 = 3.25 (creativity and innovation) | Uneven or developmental implementation of the vision | 3 – Sustain and refine |
| **Implementing Systems Thinking** | 3.26 (FI) | 4 of 10 | Items 7, 8, 9, 10 = 3.25; Item 10 SD = 1.11 | Interconnectedness strongly understood; K–12 data meetings in place | 3 – Sustain and refine |
| **Diagnosing Sustainability Challenges** | 3.25 (SI) | 5 of 10 | Item 10 = 3.22 (teacher self-efficacy) | Resource constraints, mobility, AI, environmental vulnerability, conceptual ambiguity | 1 – High |
| **Strengthening Stakeholder Collaboration** | 3.25 (SI) | 6 of 10 | Item 10 = 3.22; Item 9 SD = 1.16 (widest overall) | Stronger with teachers than with parents and the wider community | 1 – High |
| **Influencing and Storytelling** | 3.25 (SI) | 5 of 10 | Items 9, 10 = 3.23 | Storytelling a strength; community events not yet recurring | 2 – Moderate |
| **Embedding Sustainability Practices** | 3.25 (SI) | 5 of 10 | Item 10 = 3.23 (long-term impact) | Difficulty measuring intangible impact | 2 – Moderate |
| **Co-Designing Sustainability Strategy** | 3.24 (SI) | 7 of 10 | Item 10 = 3.20 (lowest overall); Items 7, 8, 9 = 3.22 | Leadership described as "reactive, not strategic"; resource constraints | 1 – High |

*Note.* V.I. = Verbal Interpretation; SI = Substantially Implemented (2.51–3.25); FI = Fully Implemented (3.26–4.00). Item numbers refer to Tables 4 to 10. Priority considers the grand mean, the number of indicators rated Substantially Implemented, the lowest item means and variability, and the qualitative evidence together.

The program follows a Learn–Apply–Reflect cycle for each module. Administrators first attend a capability session of about three hours on the domain (Learn), then each administrator leads a practical task in their own unit or section (Apply), and the cycle ends with reflection and coaching meetings in which administrators review evidence of progress with their peers (Reflect). The modules are sequenced by priority across one academic year, and each sets baseline and target values taken from the teachers' ratings. The logic of the program is presented in Table 14 and the detailed action plan in Table 15.

 

**Table 14. Logic Model of the Recommended Program**

| Inputs | Activities | Outputs | Outcomes | Impact |
|---|---|---|---|---|
| Administrators and SLT<br>Study findings (Problems 1–4)<br>ISP Class of Change resources and Learning Hub<br>UAE Green Education Partnership programs<br>PD budget and staff time | Seven capability modules (Learn–Apply–Reflect)<br>Unit-level application tasks<br>Sustainability Committee meetings<br>Stakeholder forums and signature events<br>Termly monitoring and annual review | Administrators trained in all 7 modules<br>Sustainability KPI framework and Committee in place<br>Unit application tasks completed and documented<br>Co-designed initiatives with teachers, students, and parents | Proactive, co-designed, and evidence-based sustainability leadership | Sustainability embedded in school culture, contributing to quality education (SDG 4.1, 4.5, 4.7, 4.a, 4.c) |

*Note.* SLT = Senior Leadership Team; PD = Professional Development; KPI = Key Performance Indicator; ISP = International Schools Partnership.

**Table 15. Action Plan of the Recommended Program**

| Module / Domain | Findings Basis | Objective | Strategies and Activities | Persons Involved | Time Frame | Resources | Success Indicators |
|---|---|---|---|---|---|---|---|
| **Priority 1 – High** | | | | | | | |
| **Module 1: Co-Designing Sustainability Strategy** | GM = 3.24 (SI), lowest domain<br>Items 4–10 rated SI (Table 8)<br>Item 10, innovative and context-responsive approaches = 3.20 (lowest of all 70 indicators)<br>Qual: leadership "reactive, not strategic"; resource constraints | To co-design data-informed, innovative, and context-responsive sustainability programs with stakeholders and government partners | a. Capability session: design thinking for sustainability strategy<br>b. Hold a co-design workshop each term in which teachers, students, and parents use school data to design one initiative per section<br>c. Offer small innovation grants for teacher-led, context-responsive pilots<br>d. Adapt strategies each term based on stakeholder feedback<br>e. Engage formally with MOE-led environmental programs (e.g., UAE Green Education Partnership) | Head of School, SLT, Heads of Section, Sustainability Lead | Term 1 (then termly) | ISP Learning Hub<br>Co-design workshops: AED 16,950<br>Planning sessions: AED 3,420<br>Innovation grants: AED 15,000 | Table 8, Items 4–10 at M ≥ 3.26<br>Domain GM ≥ 3.30<br>≥ 1 co-designed initiative per section<br>≥ 1 active MOE program partnership |
| **Module 2: Diagnosing Sustainability Challenges** | GM = 3.25 (SI)<br>Items 6–10 rated SI (Table 5)<br>Item 10, teacher self-efficacy = 3.22<br>Qual: resource limits, mobility, AI, heat and infrastructure, unclear definition of "sustainability challenge" | To diagnose challenges systematically, including teacher readiness, resource use, student mobility, and environmental risks | a. Capability session: root-cause and needs analysis<br>b. Run an annual teacher self-efficacy and PD needs survey before new initiatives or technologies<br>c. Set up termly resource-use monitoring (paper, energy, technology, budget) with Operations<br>d. Hold an annual environmental and infrastructure risk review<br>e. Agree on a shared glossary defining what counts as a sustainability challenge<br>f. Use mobility-responsive onboarding for new students and staff | SLT, PD Coordinator, Operations Manager, Inclusion Lead | Term 1 | Capability session costs (Table 18)<br>Existing survey tools and utility data (in-kind) | Table 5, Items 6–10 at M ≥ 3.26<br>Needs survey completed annually<br>Resource-use report issued termly<br>Glossary adopted |
| **Module 3: Strengthening Stakeholder Collaboration** | GM = 3.25 (SI)<br>Items 5–10 rated SI (Table 6)<br>Item 10, visual reminders = 3.22<br>Item 9, sharing best practices through PLCs, SD = 1.16 (widest)<br>Qual: parent and community involvement weaker than teacher involvement | To make collaboration structured, consistent across phases, role-defined, and inclusive of parents and the community | a. Capability session: facilitating collaborative problem-solving<br>b. Run a fortnightly PLC cycle and peer observation schedule applied consistently in all phases<br>c. Use a roles and responsibilities (RACI) chart and timeline for every initiative<br>d. Hold a termly stakeholder planning forum with parents, students, and community partners<br>e. Run a campus visual campaign co-designed by the student Eco-committee | Heads of Section, PLC Leads, Parent Council, Student Council | Term 1 (then ongoing) | Meeting time (in-kind)<br>Visual campaign and displays: AED 5,400<br>Forum refreshments: AED 4,500 | Table 6, Items 5–10 at M ≥ 3.26<br>SD for Item 9 reduced to < 1.00<br>PLC attendance ≥ 90%<br>3 stakeholder forums a year |
| **Priority 2 – Moderate** | | | | | | | |

| Module / Domain | Findings Basis | Objective | Strategies and Activities | Persons Involved | Time Frame | Resources | Success Indicators |
|---|---|---|---|---|---|---|---|
| **Module 4: Embedding Sustainability Practices** | GM = 3.25 (SI)<br>Items 6–10 rated SI (Table 10)<br>Item 10, long-term impact evaluation = 3.23<br>Qual: difficulty measuring intangible impact | To institutionalize sustainability through a support structure, clear indicators, and systematic review | a. Capability session: measuring impact, including intangible outcomes<br>b. Form a Sustainability Committee with terms of reference and a named Sustainability Lead<br>c. Develop a KPI framework using quantitative and qualitative indicators, including behavioral and attitudinal ones<br>d. Adopt an annual keep–improve–stop review protocol<br>e. Build sustainability into the school self-evaluation and ISP reporting | Head of School, Sustainability Lead, Committee, Data Lead | Term 2 | Committee time and existing data systems (in-kind)<br>Capability session costs (Table 18) | Table 10, Items 6–10 at M ≥ 3.26<br>Committee meets monthly<br>KPI framework approved<br>Annual review report produced |
| **Module 5: Influencing and Storytelling** | GM = 3.25 (SI)<br>Items 6–10 rated SI (Table 9)<br>Items 9 and 10 = 3.23<br>Qual: storytelling valued; community events not yet recurring | To communicate progress transparently and engage the community through stories, hands-on learning, and signature events | a. Capability session: purposeful storytelling and transparent reporting<br>b. Publish a termly sustainability progress bulletin covering purpose, outcomes, and progress<br>c. Hold story circles at staff meetings for sharing practice<br>d. Run hands-on student sustainability projects (e.g., ISP Changemakers)<br>e. Hold an annual signature Sustainability Exhibition Day open to the community | Community Relations, Heads of Section, Teachers, Student Leaders | Term 2 | Annual signature event: AED 8,000<br>Capability session costs (Table 18) | Table 9, Items 6–10 at M ≥ 3.26<br>3 bulletins a year<br>1 signature event a year<br>Student project participation rate reported |
| **Priority 3 – Sustain and Refine** | | | | | | | |
| **Module 6: Implementing Systems Thinking** | GM = 3.26 (FI)<br>Items 7–10 rated SI (Table 4)<br>Item 10, multi-source data, SD = 1.11<br>Qual: K–12 data meetings in place | To strengthen cross-grade alignment and decisions that draw on multiple sources of data | a. Capability session: systems mapping of school decisions<br>b. Hold K–12 vertical alignment sessions for transdisciplinary SDG-linked units<br>c. Build an integrated dashboard of achievement, well-being, attendance, and teacher feedback<br>d. Add a decision-impact check for SLT decisions on curriculum, operations, and staffing | SLT, Heads of Section, Data Lead | Term 3 | Existing dashboard tools (in-kind)<br>Capability session costs (Table 18) | Table 4, Items 7–10 at M ≥ 3.26<br>≥ 1 SDG-linked transdisciplinary unit per grade<br>Dashboard reviewed in each data meeting |
| **Module 7: Creating Shared Purpose and Vision** | GM = 3.27 (FI), highest domain<br>Item 10, creativity and innovation = 3.25 (only SI item; Table 7)<br>Qual: uneven implementation of the vision | To sustain the shared vision and widen teachers' room for creativity and innovation | a. Capability session: leading vision through empowerment<br>b. Keep current communication channels and recognition practices<br>c. Give teachers protected innovation time and share innovations at staff meetings<br>d. Review the vision annually with stakeholders | Head of School, SLT | Term 3 | Existing communication channels (in-kind)<br>Capability session costs (Table 18) | Table 7, Item 10 at M ≥ 3.26<br>Domain GM maintained at ≥ 3.27 |

*Note.* GM = Grand Mean; FI = Fully Implemented; SI = Substantially Implemented; Qual = qualitative evidence from Sections 3.1 to 3.3; MOE = Ministry of Education; PLC = Professional Learning Community; RACI = Responsible, Accountable, Consulted, Informed; SLT = Senior Leadership Team; PD = Professional Development; KPI = Key Performance Indicator. Item numbers refer to Tables 4 to 10. Amounts in AED are taken from Table 18; capability session costs (AED 17,075) are shared across the seven modules. Targets use the study's scale, in which 3.26–4.00 is interpreted as Fully Implemented.

Program implementation will be monitored each term and evaluated at the end of the academic year (Table 16). The main measure of impact is a re-administration of the teacher survey, compared against the baseline values in Tables 4 to 10; qualitative evidence will come from administrator reflection logs and focus group discussions with teachers, students, and parents. Evaluation is organized as a feedback loop with three linked stages, each of which examines its evidence at a fixed review point, applies a stated decision rule, and records the resulting change. At the module level, an application task completed by fewer than 80% of administrators is carried into the next module, and any practice that at least one third of administrators find difficult is revisited through a worked example. At the termly level, the Sustainability Committee classifies each indicator as on track, slow, or off track against its target: slow indicators become the main agenda item of the next co-design workshop and receive priority for innovation grants, and indicators off track for two consecutive terms lead to revised module content and targeted coaching, all recorded in a termly action note approved by the Senior Leadership Team. At the annual level, a keep–improve–stop review retains and writes into policy the practices that reach the Fully Implemented target ($M \geq 3.26$), refines those that improve without reaching it, and stops those that show little benefit; the results then reset the baselines and priorities for the next cycle. After each termly and annual review, a summary of what was found and what will change is shared with teachers, students, and parents to sustain their involvement.

**Table 16. Monitoring and Evaluation Plan**

| Indicator | Means of Verification | Frequency | Responsible | Reported To |
|---|---|---|---|---|
| **Extent of implementation of the 70 practices** | Re-administration of the teacher survey | Annually (post-test) | Researcher / Sustainability Lead | Head of School; ISP Region |
| *Baseline:* Overall M = 3.25 (Substantially Implemented); domain grand means of 3.24 to 3.27; 37 of the 70 items rated Fully Implemented (Tables 4 to 11).<br>*Target:* Every one of the 70 items at $M \geq 3.26$ and every domain grand mean at $M \geq 3.30$, with fewer Partially or Minimally Implemented ratings on each item than at baseline. | | | | |
| **Completion of capability modules** | Attendance records; application task portfolios | Per module | PD Coordinator | SLT |
| *Baseline:* None; the modules are new to the school.<br>*Target:* At least 90% attendance at each capability session, and at least 80% of administrators completing each application task (the decision rule used in the module-level review). | | | | |
| **Quality of unit application tasks** | Reflection logs; peer review | Termly | Heads of Section | Sustainability Committee |
| *Baseline:* None; a peer-review rubric is agreed during orientation and first applied to the Term 1 tasks.<br>*Target:* By the end of Term 3, at least three in every four application tasks judged as meeting the rubric standard. | | | | |
| **Stakeholder engagement** | Forum attendance; parent and student feedback | Termly | Community Relations | SLT |
| *Baseline:* Attendance and feedback recorded at the first termly forum in Term 1.<br>*Target:* About 60 attendees at each termly forum, the number assumed in the budget (Table 18), with teachers, students, and parents all represented. | | | | |
| **Resource use and environmental performance** | Paper, energy, and technology use data | Termly | Operations Manager | Sustainability Committee |
| *Baseline:* Paper, energy, and technology-use records for Academic Year 2026–2027, compiled during orientation.<br>*Target:* A 5% reduction in paper and energy use against the baseline by the end of the year, to be adjusted once the baseline records are compiled. | | | | |
| **Long-term impact on learning and well-being** | Achievement, attendance, and well-being data | Annually | Data Lead | Head of School |

| Indicator | Means of Verification | Frequency | Responsible | Reported To |
|---|---|---|---|---|
| *Baseline:* Achievement, attendance, and well-being data for Academic Year 2026–2027.<br>*Target:* Results maintained or improved. Changes are reported as trends and are not attributed to the program alone. | | | | |
| **Progress on priority items** | Short pulse survey of the lowest-rated items in Table 13 | Termly | Sustainability Lead | Sustainability Committee |
| *Baseline:* Table 8, Item 10, innovative and context-responsive approaches (M = 3.20); Table 5, Item 10, teachers' self-efficacy (M = 3.22); Table 6, Item 10, visual reminders (M = 3.22); Table 6, Item 9, sharing best practices (M = 3.23, SD = 1.16, with at least 12 teachers, about 13%, rating it Minimally Implemented).<br>*Target:* Termly targets. Table 8, Item 10: M ≥ 3.22 in Term 1, M ≥ 3.24 in Term 2, and M ≥ 3.26 in Term 3. Table 5, Item 10 and Table 6, Item 10: M ≥ 3.23, M ≥ 3.25, and M ≥ 3.26. Table 6, Item 9: SD ≤ 1.10, SD ≤ 1.05, and SD < 1.00, with M ≥ 3.26 and no more than 6 Minimally Implemented ratings by Term 3. | | | | |
| **Stakeholder co-design participation and outputs** | Workshop attendance by stakeholder group; number of initiative proposals generated, approved, and piloted | Termly | Sustainability Lead | SLT |
| *Baseline:* None; the co-design workshops begin with the program.<br>*Target:* Three workshops of about 45 participants each, with administrators, teachers, students, and parents represented, and at least two teacher-led pilots approved each term (six in the year, as budgeted in Table 18). | | | | |
| **Follow-through on feedback decisions** | Module summaries; termly action notes; completion check of previous actions | Per module and termly | PD Coordinator | SLT |
| *Baseline:* None; action notes begin with the first module review.<br>*Target:* Every action in the previous note checked at the next review, and at least 80% of actions completed by that review. | | | | |

*Note.* Baselines come from the teachers' ratings in Tables 4 to 11 or from school records for Academic Year 2026–2027; where no earlier record exists, the baseline is the first measurement taken in Term 1. Item numbers refer to Tables 4 to 10. Survey-based targets use the study's interpretation scale, in which a mean of 3.26 or higher is Fully Implemented. Targets for school records are first estimates and are confirmed by the Sustainability Committee once the baselines are compiled.

The program runs over Academic Year 2027–2028 (Table 17). Expert validation and revision take place before Term 1. The three Priority 1 modules are delivered in Term 1, the two Priority 2 modules in Term 2, and the two Priority 3 modules in Term 3, while coaching, co-design workshops, innovation grants, stakeholder forums, and termly reviews recur every term. The year closes with the annual evaluation, the sharing of findings, and the revision of the program for the next cycle.

**Table 17. Implementation Timeline of the Recommended Program, Academic Year 2027–2028**

| Activity and Timing | Before Term 1 | Term 1 | Term 2 | Term 3 | End of Year |
|---|---|---|---|---|---|
| Expert validation and revision of the Recommended Program<br>*Timing: May–July 2027, before the program starts* | ✓ | | | | |
| Orientation, baseline review, and Committee formation<br>*Timing: Term 1, Weeks 1–2 (late August to early September 2027)* | | ✓ | | | |
| Module 1: Co-Designing Sustainability Strategy<br>*Timing: Term 1, Weeks 3–6 (September 2027); applied again in the Week 3 co-design workshop of Terms 2 and 3* | | ✓ | ✓ | ✓ | |
| Module 2: Diagnosing Sustainability Challenges<br>*Timing: Term 1, Weeks 7–10 (October 2027)* | | ✓ | | | |

| Activity and Timing | Before Term 1 | Term 1 | Term 2 | Term 3 | End of Year |
|---|---|---|---|---|---|
| Module 3: Strengthening Stakeholder Collaboration<br>*Timing: Term 1, Weeks 11–13 (November 2027); applied again through the termly stakeholder forums of Terms 2 and 3* | | ✓ | ✓ | ✓ | |
| Module 4: Embedding Sustainability Practices<br>*Timing: Term 2, Weeks 2–5 (January to early February 2028)* | | | ✓ | | |
| Module 5: Influencing and Storytelling<br>*Timing: Term 2, Weeks 6–9 (February to early March 2028)* | | | ✓ | | |
| Module 6: Implementing Systems Thinking<br>*Timing: Term 3, Weeks 2–5 (April to early May 2028)* | | | | ✓ | |
| Module 7: Creating Shared Purpose and Vision<br>*Timing: Term 3, Weeks 6–9 (May to early June 2028)* | | | | ✓ | |
| Coaching and reflection meetings after each module<br>*Timing: Final week of each module (Reflect phase)* | | ✓ | ✓ | ✓ | |
| Module-level review and module summary<br>*Timing: Within two weeks after each module ends* | | ✓ | ✓ | ✓ | |
| Stakeholder co-design workshops and planning sessions<br>*Timing: Workshop in Week 3 of each term (September 2027, January 2028, April 2028); planning sessions in Weeks 2 and 4* | | ✓ | ✓ | ✓ | |
| Innovation grants: call for proposals, selection, and teacher-led pilots<br>*Timing: Each term: call for proposals in Week 4, selection in Week 6, pilots from Week 7 to the end of the term* | | ✓ | ✓ | ✓ | |
| Visual campaign and displays<br>*Timing: Launched in Term 1, Week 3; displays refreshed at the start of Terms 2 and 3* | | ✓ | ✓ | ✓ | |
| Termly stakeholder forums<br>*Timing: Last three weeks of each term (December 2027, March 2028, June 2028)* | | ✓ | ✓ | ✓ | |
| Annual sustainability signature event<br>*Timing: Term 3, Week 10 (June 2028)* | | | | ✓ | |
| Termly review, pulse survey, and action note<br>*Timing: Last three weeks of each term (December 2027, March 2028, June 2028)* | | ✓ | ✓ | ✓ | |
| Focus group discussions with teachers, students, and parents<br>*Timing: Last two weeks of Term 3 (late June 2028)* | | | | | ✓ |
| Post-survey, evaluation, and keep–improve–stop review<br>*Timing: Last two weeks of Term 3 (late June to early July 2028)* | | | | | ✓ |
| Sharing of findings with teachers, students, and parents<br>*Timing: After each termly review and at the close of the year (early July 2028)* | | ✓ | ✓ | ✓ | ✓ |
| Revision of the Recommended Program for the following year<br>*Timing: July–August 2028, before Academic Year 2028–2029 begins* | | | | | ✓ |

*Note.* ✓ = scheduled activity. Modules 1 and 3 are delivered in Term 1 and applied again in Terms 2 and 3 through the termly co-design workshops and stakeholder forums, respectively. Terms follow the UAE school calendar: Term 1 runs from late

August to mid-December, Term 2 from early January to late March, and Term 3 from April to early July. Each module runs as a four-week Learn–Apply–Reflect cycle (three weeks for Module 3). Week numbers count from the first teaching week of each term. Sessions falling during Ramadan, expected from late January to late February 2028, will be scheduled within the shortened school day.

The estimated budget for one academic year is AED 75,962, or roughly AED 528 for each of the school's 144 employees (Table 18). Each estimate is built from a quantity and an indicative Dubai market unit cost; because all sessions take place on campus, no venue cost is included, and staff time is treated as an in-kind contribution. Co-design is costed in two items, the termly stakeholder workshops and the smaller core-team planning sessions, while the innovation grants are kept separate because they finance the teacher-led pilots that emerge from the workshops. The figures should be confirmed through the school's procurement quotations before the program begins.

**Table 18. Estimated Budget of the Recommended Program**

| Item | Basis of Estimate (Quantity × Unit Cost, AED) | Source of Funds | Estimated Cost (AED) |
|---|---|---|---|
| Capability sessions (facilitation, materials, and refreshments) | External facilitation of the three priority-1 modules: 3 × 3,000 = 9,000<br>Refreshments: 7 sessions × 19 administrators × 50 = 6,650<br>Printed workbooks: 19 × 75 = 1,425<br>Other four modules facilitated by SLT with ISP Learning Hub resources (no cash cost) | School PD budget | 17,075 |
| Coaching and reflection meetings | Held within existing SLT meeting time | In-kind (staff time) | 0 |
| Stakeholder co-design workshops (Module 1; one per term) | 3 workshops × 45 participants (8 administrators, 15 teachers, 12 students, 10 parents)<br>Co-design facilitation: 3 × 2,500 = 7,500<br>Refreshments: 3 × 45 × 50 = 6,750<br>Design materials and printed data packs: 3 × 900 = 2,700 | ISP sustainability grant (school PD budget as fallback) | 16,950 |
| Co-design planning sessions (core team) | 6 sessions (one before and one after each workshop) × 12 core-team members<br>Refreshments: 6 × 12 × 35 = 2,520<br>Printed data summaries: 6 × 150 = 900 | School PD budget | 3,420 |
| Innovation grants for teacher-led pilots | 6 pilots (2 per term, selected from co-design workshop proposals) × 2,500 | ISP sustainability grant (school budget as fallback) | 15,000 |
| Visual campaign and displays | A1 display boards: 20 × 150 = 3,000<br>Roll-up banners: 4 × 350 = 1,400<br>Bin and energy-point signage: 1,000 | Operations budget | 5,400 |
| Stakeholder forums and signature event | Forum refreshments: 3 termly forums × 60 attendees × 25 = 4,500<br>Annual signature event (stalls, signage, sound system hire): 8,000 | Events budget | 12,500 |
| Monitoring and evaluation activities | Focus group refreshments: 3 groups × 10 participants × 50 = 1,500<br>Printing of termly action notes and annual report: 500 | School PD budget | 2,000 |

| Item | Basis of Estimate (Quantity × Unit Cost, AED) | Source of Funds | Estimated Cost (AED) |
|---|---|---|---|
| Dashboard and survey tools | Existing licensed survey and dashboard platforms | Existing school systems (in-kind) | 0 |
| **Subtotal** | | | **72,345** |
| **Contingency** | 5% of subtotal for price changes and unforeseen costs: 0.05 × 72,345 | Operations budget | **3,617** |
| **Total** | | | **75,962** |

*Note.* All amounts are in UAE dirhams (AED) for one academic year. Totals by source of funds: school PD budget, AED 22,495; ISP sustainability grant, AED 31,950; operations budget, AED 9,017 (including contingency); events budget, AED 12,500; total, AED 75,962. If the ISP sustainability grant is not secured, the co-design workshops are funded from the school PD budget and the innovation grants are reduced to four pilots (AED 10,000). SLT = Senior Leadership Team; PD = Professional Development; ISP = International Schools Partnership.

Anticipated risks and their mitigation are summarized in Table 19. The program has not yet been validated by experts or piloted, as both steps were outside the scope of this study; its relevance, feasibility, and acceptability have therefore not been empirically established. Before implementation, a panel of three to five experts who did not take part in the study, such as ISP regional leaders, school leaders with UAE inspection experience, and academics in educational leadership, will rate the program on the six criteria in Table 20 using a four-point scale from 1 (Not Acceptable) to 4 (Highly Acceptable). Any criterion with a mean below 3.26, and any part of the program questioned by at least two validators, will be revised before the program is presented to the school. With full implementation, the program is expected to contribute to quality education through improved learning outcomes (SDG 4.1), inclusion (SDG 4.5), education for sustainable development and global citizenship (SDG 4.7), safe and sustainable learning environments (SDG 4.a), and a stronger teaching workforce (SDG 4.c).

**Table 19. Anticipated Risks and Mitigation Strategies**

| Risk | Mitigation Strategy |
|---|---|
| Staff and student mobility interrupts continuity | Document practices in policies and handover files; induct new staff into the program; assign each initiative to a team rather than an individual |
| Limited time and competing priorities | Integrate modules into existing meetings, PLCs, and data meetings instead of adding new ones |
| Resource and budget constraints | Prioritize low-cost actions; apply for ISP and government sustainability grants |
| Initiative fatigue | Use the keep–improve–stop review so that initiatives are discontinued as well as added |
| Difficulty measuring intangible outcomes | Combine survey results with behavioral indicators, reflection logs, and stakeholder narratives |

**Table 20. Criteria for the Proposed Expert Validation of the Recommended Program**

| Criterion | Guiding Question for Validators |
|---|---|
| Relevance to the findings of the study | Do the modules and activities respond to the problems identified in the qualitative and quantitative findings (Problems 1 to 4)? |
| Alignment with SDG 4 and school priorities | Are the objectives consistent with the SDG 4 targets addressed and with the improvement priorities of the school and ISP? |
| Feasibility of implementation | Can the activities be carried out within the proposed timeline, staffing, and budget? |

 

| Criterion | Guiding Question for Validators |
|---|---|
| Acceptability to stakeholders | Are the activities likely to be accepted by administrators, teachers, students, and parents? |
| Clarity of objectives, activities, and indicators | Are the objectives, activities, and monitoring indicators stated clearly enough to be acted on and measured? |
| Sustainability of the program | Can the program continue beyond its first year through the structures and feedback loop it sets up? |

*Note.* No ratings are reported because the expert validation has not yet been conducted. Each criterion will be rated from 1 (Not Acceptable) to 4 (Highly Acceptable), and mean ratings will be interpreted as follows: 3.26–4.00 Highly Acceptable; 2.51–3.25 Acceptable; 1.76–2.50 Slightly Acceptable; 1.00–1.75 Not Acceptable.

## IV. CONCLUSION

This study found that the administrators of Nibras International School conceptualized sustainability leadership as an interconnected, long-term, evidence-informed, and participatory process, placing shared vision, trust, adaptive planning, and cultural embedding at the center of sustainable school improvement. Their reported practices across the seven domains form a coherent and potentially cyclical approach to improvement, in which systems awareness informs diagnosis, diagnosis informs collaboration and shared direction, these guide strategic co-design, communication supports engagement, and institutional embedding sustains review and further improvement. Teachers perceived these practices as substantially implemented overall (M = 3.25), with Creating Shared Purpose and Vision rated highest and Co-Designing Sustainability Strategy lowest. The small spread in domain means does not warrant claims of meaningful superiority, but the integrated findings point to a possible leader–teacher perception gap in collaboration and co-design, and the dispersion of ratings shows that the practices are not experienced equally across the school. Viewed through the study's three theoretical lenses, sustainability leadership at the school may be understood as a transformational, systemic, and sustainability-oriented process through which administrators influence stakeholders, connect organizational practices, and pursue continuous improvement toward SDG 4. These findings support a targeted Recommended Program, "Leading the Class of Change," rather than a wholesale redesign of existing leadership practice.

Accordingly, administrators should establish a regular, documented sustainability leadership review cycle; translate the comparatively strong shared vision into a written, measurable, and collaboratively developed sustainability strategy with SDG 4 objectives, responsibilities, resources, timelines, and indicators; and give teachers consistent opportunities to participate in planning, implementation, and evaluation through representative working groups, protected collaboration time, and transparent feedback on how their recommendations influence decisions. Professional development should address systems thinking, root-cause analysis, inclusive engagement, the ethical use of technology, and the evaluation of initiatives; students should take part in age-appropriate sustainability projects and feedback activities; and parents and community partners should be engaged through accessible, culturally responsive mechanisms that account for family mobility. The school should consider piloting the Recommended Program, collecting baseline and follow-up evidence before making claims of effectiveness.

The study has several limitations. The administrators' accounts were self-reported and may be affected by social desirability, and teachers' ratings reflect perceptions shaped by their own experiences and working relationships rather than observed practice. The findings come from a single school and cannot be generalized to all international schools. The survey indicators were derived from the administrators' narratives rather than a literature-based scale, reliability was established only for the instrument as a whole, and no inferential tests were performed. The Recommended Program was developed but not validated or tested. Future research should examine the seven-domain framework and 70-item instrument across diverse educational institutions, triangulate sustainability leadership practices through teacher perceptions, classroom observation, and institutional document analysis, and investigate the relationship between sustainability leadership practices and educational outcomes measured against SDG 4 indicators.

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