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Building pathways for empowering secondary school students to become agents of change for environmental and climate action.

PATHWAYS Handbook

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Summary of the Project

PATHWAYS - Building pathways for empowering secondary school students to become agents of change for environmental and climate action

The PATHWAYS project addresses the growing need for enhanced support, expertise, and training for educators to effectively integrate environmental sustainability into their teaching practices. Its primary aim is to provide opportunities for secondary school teachers and school leaders to participate in continuous professional development programs dedicated to environmental sustainability. By focusing on secondary school teachers, school authorities, and students, the project seeks to build a foundation for meaningful climate action within educational communities.

The project PATHWAYS is co-funded by the European Education and Culture Executive Agency of the European Commission and the Erasmus+ program. It is carried out through collaboration among five partner organizations across Greece, Turkey, the Netherlands, and France.

Objectives:

The overall objective of the project is to empower secondary school students to become agents of change for environmental and climate action through supporting, teaching, learning and activism for environmental sustainability.

The specific objectives are:

- To enhance teachers and school leaders' knowledge and capacities for embedding learning for environmental sustainability in an integrated and holistic manner.
- To support students and the broader school communities' civic engagement in promoting environmental sustainability.
- To facilitate cooperation, networking and scaling up of good practices in fostering students' learning and engagement in environmental sustainability across Europe.
- To raise awareness among the general public on environmental and climate-change challenges and the role of school communities in tackling them.

Main Results:

The PATHWAYS project will deliver significant tools and resources to empower educators and students in addressing environmental and climate challenges. A comprehensive e-learning course will be developed, piloted, and disseminated to enhance the knowledge and skills of teachers and

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school leaders, enabling them to integrate environmental sustainability into their practices. Additionally, a practical handbook will guide teachers, school leaders, and students in planning and implementing climate and environmental initiatives.

To foster collaboration and the exchange of ideas, a virtual platform will be established, allowing students and teachers to share experiences, best practices, and lessons learned in promoting environmental sustainability. The project will also implement a comprehensive dissemination strategy, including a distinct visual identity, a dedicated website, social media accounts, press releases, digital materials, and online events, ensuring broad visibility and effective communication of its results.

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1 Introduction

1.1 Schools as Catalysts for Sustainability

Schools have a unique role in addressing today's environmental challenges. As spaces for learning and collaboration, they can serve as catalysts for sustainability, teaching future generations to live in harmony with the planet while transforming their operations and culture to reflect these values (European Commission, 2023). This handbook equips educators, school leaders, and stakeholders with practical tools and strategies to bring this vision to life.

The handbook, grounded in the principles of the PATHWAYS Erasmus+ project, emphasizes holistic, community-driven approaches to sustainability. It highlights the importance of research and planning as essential foundations for long-lasting change, ensuring initiatives are strategic and impactful.

Bridging Knowledge and Action

Sustainability can feel overwhelming, but this handbook simplifies it by connecting theoretical knowledge with actionable steps. By breaking down complex concepts into practical strategies, it helps schools translate abstract goals into measurable results. Chapter 2, "Research and Planning," offers a structured process to assess starting points and build informed action plans (European Commission, 2023).

Promoting a Whole-School Approach

Sustainability is most effective when embraced by the entire school community—not just as a subject but as a guiding principle for governance, curriculum, operations, and community engagement. The handbook provides a roadmap for integrating sustainability into these areas, ensuring initiatives are both impactful and sustainable.

Empowering Educators and Students

Teachers and students are central to any sustainability journey. The handbook offers educators tools for embedding sustainability into lessons and projects, while inspiring students to become active changemakers. Chapter 2 provides guidance on identifying meaningful opportunities for engagement, ensuring efforts are data-driven and aligned with broader goals (UNESCO, 2017).

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Inspiring Collaboration and Community

Sustainability extends beyond schools, requiring collaboration with parents, local businesses, policymakers, and other stakeholders. This handbook guides schools in building strong networks to amplify their efforts and inspire collective action. Chapter 2 highlights strategies for identifying and mobilizing community resources as part of the planning process.

Fostering Long-Term, Systemic Change

True sustainability requires systemic, lasting change that becomes part of a school's identity. The handbook offers tools for planning, monitoring, and evaluating initiatives to ensure they remain effective over time (European Commission, 2023). Chapter 2 is critical to this process, helping schools set clear goals, track progress, and adapt to evolving challenges.

By following this guide, schools can embed sustainability into their identity, creating meaningful change that inspires future generations and contributes to a more sustainable world.

1.2 Why this Handbook matters

Schools are uniquely positioned to lead in environmental sustainability, serving as hubs for learning, innovation, and community collaboration (UNESCO, 2024). This handbook acknowledges that each school has unique strengths, challenges, and opportunities, providing tailored support whether your school is just beginning its sustainability journey or expanding existing efforts.

By emphasizing creativity, flexibility, and practicality, this resource offers tools, strategies, and case studies to help educators, students, and school leaders implement effective sustainable practices (European Commission, 2024).

Using this handbook, schools can:

- **Transform Operations:** Implement measures to reduce ecological footprints, from energy efficiency to waste management.
- **Inspire Learning:** Engage students with sustainability-focused lessons, projects, and activities, fostering critical thinking and innovation (Nord Anglia Education, 2024).

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- **Build Collaboration:** Foster a shared sense of responsibility by engaging students, staff, parents, and community stakeholders in meaningful partnerships (Jäggl, 2024).

This handbook emphasizes the importance of research and planning as detailed in Chapter 2, helping schools understand their current position, set strategic goals, and ensure systemic, lasting change.

A Call to Action

The urgency of climate change demands bold, collective action. Schools have the power to lead by example, equipping students with the skills, knowledge, and motivation to make an impact. This handbook transforms sustainability from an abstract concept into a daily practice that inspires the entire school community (Uzorka, 2024).

Together, we can reimagine schools as beacons of hope for a sustainable future. With this handbook, you are equipped with the knowledge, tools, and vision to take meaningful steps toward lasting change.

1.3 Target Audience

Achieving environmental impact requires collaboration across the entire school community and beyond. Each group plays a vital role, and this handbook provides tailored guidance to advance sustainability.

Teachers: Pioneers of Sustainability in Education

Teachers shape educational experiences and inspire a sustainability mindset by connecting learning to real-world issues and leading by example (Higgins & Kearney, 2023). This handbook equips teachers with practical tools to integrate sustainability into lessons, extracurricular activities, and projects. It also offers interdisciplinary approaches for linking sustainability to subjects from STEM to the arts (Bennett et al., 2023) and guidance on taking leadership roles to inspire peers and mobilize students.

School Leaders and Administrators: Driving Systemic Change

Administrators play a crucial role in embedding sustainability into school vision, policies, and operations, enabling long-term change (Leithwood & Jantzi, 2024). This handbook provides strategic

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frameworks to align sustainability goals with the school's mission, tools to foster partnerships with stakeholders, and insights into policies and investments for transformative sustainability efforts.

Students: The Change-Makers of Tomorrow

Students are at the forefront of sustainability efforts in their schools and communities (Cohen & Kelsey, 2024). This handbook empowers students with case studies of successful student-led projects, practical tools for leading climate initiatives, and opportunities to develop critical thinking, problem-solving, teamwork, and leadership skills.

Community Stakeholders: Partners in Progress

Sustainability is a shared responsibility, and parents, organizations, businesses, and policymakers play critical roles in amplifying school initiatives (Smith & Jones, 2023). This handbook offers strategies for collaboration, guidance on building strong school-community partnerships, and examples of collective actions achieving meaningful environmental outcomes.

Together, teachers inspire, administrators provide strategic vision, students lead with passion, and community stakeholders amplify efforts. Whether shaping lessons, policies, or partnerships, this guide empowers every group to contribute effectively to a more sustainable future.

1.4 How to Use this Handbook

This handbook serves as a dynamic resource, empowering schools to embrace sustainability in ways tailored to their unique contexts. Whether taking first steps or refining established programs, it provides the flexibility to follow a structured approach or focus on specific areas of need, transforming sustainability into a lived reality embedded in the school community.

For schools just beginning their journey, the handbook offers a clear progression from foundational principles to actionable strategies. It emphasizes starting with research and planning, helping schools assess current practices, identify opportunities, and develop a shared vision for sustainability. This foundation ensures initiatives are strategic, inclusive, and impactful.

The next stage focuses on building connections, fostering collaboration among students, staff, and stakeholders. Sustainability thrives when integrated into relationships and curriculum, creating a culture of shared responsibility and reinforcing its relevance through partnerships.

Implementation transitions vision into action, guiding schools in applying tools, conducting audits, creating timelines, assigning responsibilities, and monitoring progress. This structured sequence enables schools to achieve measurable outcomes with confidence, regardless of their experience or resources.

Reflection and evaluation are essential to sustaining progress. Revisiting initial goals allows schools to measure impact, gather feedback, and identify opportunities for growth. This dynamic process ensures sustainability efforts evolve, celebrating successes while refining strategies.

For schools with existing programs, the handbook's modular structure supports targeted improvements. Revisiting research and planning principles refines strategies, while strengthening community connections amplifies initiatives. Schools can enhance implementation by optimizing resources and expanding the scope of their efforts. Reflection remains key to maintaining momentum and tracking progress.

By offering a flexible structure, this handbook equips schools to adapt their sustainability efforts, whether following a step-by-step progression or focusing on specific areas. It provides the tools to drive meaningful, lasting change tailored to each school's needs.

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2 Researching and Planning

The world is grappling with significant environmental, social, and economic challenges such as climate change, pollution, disaster risk, poverty, water scarcity, and urbanization. A major contributor to these problems is the growing mismatch between the resources consumed due to population growth and the planet's capacity to replenish them (UNESCO, 2012).

This crisis stems in part from a lack of education, insensitivity, or self-centred attitudes toward environmental issues. Education plays a pivotal role in addressing these challenges, as environmental problems cannot be solved solely through technology or legal measures. Real change requires a shift in behaviours, attitudes, and values across individuals and society. Transforming behaviour begins with transforming our thought systems (Davis, 2010).

Despite their responsibility for environmental and climate change education, schools across Europe often fall short of addressing these topics comprehensively. Such subjects are commonly confined to science and geography classes, leaving gaps in their civic, social, and economic dimensions. Moreover, factors like teaching quality, educational methods, and socio-cultural influences—including moral values, customs, traditions, and political and economic contexts—impact the effectiveness of education (Atasoy, 2015).

Chapter 2: Research and Planning aims to bridge this gap by equipping teachers, school principals, and leaders with the tools, materials, and guidelines necessary to develop and implement environmental sustainability initiatives. It focuses on building knowledge, skills, and motivation while fostering civic engagement among students and their communities. This chapter aligns with the broader goals of the project by supporting the initiation, planning, and execution of meaningful environmental projects.

Chapter 2 is organized into five sub-topics designed to guide educators and school leaders in preparing sustainability projects, setting goals, and adequately planning their implementation.

1. **Identifying Environmental Challenges and Opportunities**: Introduces common environmental challenges schools face and presents successful practices, case studies, and tools for collaboratively identifying and evaluating environmental problems.

2. **Building Knowledge and Research Skills**: Focuses on the essential knowledge and skills needed to conduct preliminary research on environmental issues. It provides guidance on raising environmental awareness, collecting and analyzing data, and documenting findings.

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3. **Setting Measurable Goals and Priorities**: Explains how to translate research findings into clear, measurable goals. It highlights criteria for prioritizing objectives and strategies for engaging the school community in the goal-setting process.

4. **Developing Innovative Concepts and Project Proposals:** Summarizes the development of innovative concepts and ideas for environmental initiatives. It offers tools for brainstorming and transforming concepts into effective project proposals, with templates included for practical use.

5. **Planning and Monitoring Environmental Initiatives**: Details the steps in planning activities for an environmental initiative. It provides examples of successful planning processes, including how to develop timelines, ensure participation, and monitor progress.

By addressing these subtopics, Chapter 2 equips readers with the foundation necessary to launch well-researched and effectively planned sustainability projects.

2.1 Environmental Challenges in Schools

2.1.1 Typical Environmental Challenges

Schools face numerous environmental challenges that impact resource use and their ecological footprint. Addressing these issues is critical for fostering sustainable practices and raising environmental awareness among students. Effective strategies include energy and water efficiency projects, improved waste management, awareness-raising initiatives, and sustainable transportation methods. These efforts not only reduce environmental impacts but also cultivate a culture of sustainability.

To better understand these challenges, focus group interviews were conducted in November 2024 by Doğa Schools as part of the PATHWAYS project "Work Package 3 The Pathway to Bringing Learning into Action." The 21 participants, including school principals, teachers, and educational experts, identified the following common issues:

1. **Energy Consumption and Waste:** High energy use in classrooms, laboratories, and other school spaces is exacerbated by leaving devices and lights on unnecessarily. Outdated, low-efficiency lighting systems further contribute to energy waste.

2. **Water Consumption and Waste:** Unconscious water usage in shared facilities and aging water systems lead to excessive consumption. Leaks in pipes and taps also result in significant water waste.

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3. **Waste Management and Recycling:** Organic and packaging waste, particularly in school canteens, often goes unrecycled due to inadequate recycling infrastructure or awareness. This contributes to environmental pollution.

4. **Paper Waste:** Reliance on printed materials for exams, homework, and announcements creates significant paper waste, especially when recycling practices are insufficient.

5. **Air Pollution and Poor Air Quality:** Schools in urban areas are affected by emissions from heavy traffic, including school buses and private vehicles. Poor ventilation in classrooms further compromises indoor air quality, posing health risks to students and staff.

6. **Chemical and Toxic Substances:** Cleaning products, laboratory chemicals, and art supplies may contain harmful substances that impact health and the environment. Improper disposal exacerbates these risks.

7. **Lack of Green Spaces:** Urbanization limits access to green areas, reducing students' connection to nature and environmental awareness. Chemical fertilizers and pesticides used for maintenance of existing spaces can further harm ecosystems.

8. **Inadequacies in Awareness and Education Programs:** Limited inclusion of environmental sustainability in school curricula diminishes teachers' and students' understanding of environmental challenges, hindering solution-oriented approaches.

2.1.2 Identifying Specific Environmental Issues

Identifying environmental challenges within schools is essential for raising awareness and fostering engagement among students, teachers, and administrators. Each school's environmental issues vary based on its regional, physical, social, and economic context. Adopting tailored approaches can ensure a thorough understanding of these challenges. While various methodologies have been developed by academics, experts, and international organizations, the following strategies offer effective starting points:

2.1.2.1 Observation and Environmental Audit

Observation and systematic audits are fundamental for identifying environmental problems. Tilbury and Wortman (2008) highlighted how school communities can use these methods to:

- Identify environmental pollution, garbage accumulation, and air pollution caused by improper waste separation or non-recycling.

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- Assess high energy consumption in classrooms, toilets, and other shared areas due to inefficient electricity and water usage habits.
- Detect waste of natural resources caused by outdated infrastructure or limited access to green spaces.

Environmental audits enable schools to comprehensively evaluate their current practices and identify specific areas for improvement.

2.1.2.2 Surveys and Feedback

Written or digital surveys provide an avenue for students, teachers, and staff to offer insights on key issues, including energy consumption, water conservation, and recycling practices. Surveys can help:

- Create a shared institutional vision for sustainability.
- Actively involve school community members in change initiatives. Additionally, students can extend their research by surveying neighbourhood residents, gaining insights into broader environmental issues affecting the community (United Nations Environment Programme [UNEP], 2014).

2.1.2.3 Data Collection

Data collection enables schools to assess specific environmental challenges using a combination of public resources, local data, and advanced tools. Examples include:

- **Air Quality and Noise Levels**: Teachers and students can measure air pollution or noise in the school area using air quality sensors or noise-monitoring mobile apps. Platforms such as AirVisual provide detailed data on local air quality.
- **Local Resources and Reports**: Schools can review environmental reports from municipal units or government agencies, such as the Türkiye State of Environment Report (Ministry of Environment, Urbanization and Forestry, 2020), which provides ecological data and indicators for sustainability.
- **Water and Soil Sampling**: Using simple test kits, schools can analyse the pH levels of soil and the degree of water pollution, assessing their impacts on the local environment. Foundations like the Nature Conservation Centre provide resources for sustainable resource management.

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- **Mapping Tools**: Geographic platforms such as Google Earth and ArcGIS allow schools to map green spaces, identify hazardous areas, and visualize environmental issues in their surroundings.

2.1.2.4 Local Ecosystem Awareness Seminars and Training

Educational programs that emphasize local ecosystems can empower schools to take a leadership role in sustainability efforts. Resources such as UNESCO's Education for Sustainable Development Toolkit (2006) encourage schools to link community sustainability goals with education. Key actions include:

- Forming environmental committees to collaboratively address environmental challenges.
- Organizing environmental awareness programs that provide insights into local ecosystems, including plants, animals, air, and water quality.

These initiatives build a deeper understanding of environmental impacts and encourage active participation from students and staff.

2.1.2.5 Collaboration with Experts and Organizations

Partnering with local experts, municipalities, and environmental organizations helps schools gain technical guidance and develop broader perspectives on sustainability. Examples include:

- Gaining expert support for air quality measurement, waste analysis, or energy audits.
- Developing joint projects with local environmental organizations, municipalities, or other schools.
- Utilizing platforms like the European Environment Agency's Climate-ADAPT, which provides tools, data, and strategies to support climate adaptation and sustainability initiatives in European schools.

Collaboration fosters innovative solutions and strengthens the school community's capacity to address environmental challenges.

2.1.3 Tools for Assessing Environmental Conditions

Evaluating the environmental condition of a school is a vital step toward sustainability. By involving both school administrations and students, schools can assess their resource usage, waste management, and overall environmental health. Various tools and methods can guide this

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evaluation, providing actionable insights to reduce environmental impact and set sustainability goals.

2.1.3.1 Environmental Audit

An environmental audit systematically reviews a school's environmental impacts, identifying areas for improvement and implementing measures to mitigate these impacts. Key areas include energy consumption, waste management, water use, air quality, and environmentally friendly practices.

The **Environmental Impact Assessment (EIA)** methodology further enhances the audit process, enabling schools to evaluate risks and propose solutions for resource utilization. This hands-on approach helps students understand the environmental footprint of their schools while fostering problem-solving skills (Ministry of Environment, Urbanization, and Forestry, 2024).

Key tools for conducting audits include:

a. **ISO 14001 Environmental Management System Standards**

- Developed by the International Organization for Standardization (ISO), ISO 14001 provides guidelines for assessing environmental factors throughout the lifecycle of products and processes.
- Schools can use these standards to evaluate their structural and operational environmental performance, ensuring control measures to minimize impact (ISO, 2024).

b. **Green Building Certifications (LEED, BREEAM, WELL)**

- Certifications such as LEED (Leadership in Energy and Environmental Design), BREEAM (Building Research Establishment Environmental Assessment Method), and WELL Building Standard recognize buildings that meet sustainable design criteria.
- These certifications assess factors such as energy efficiency, resource conservation, material selection, and occupant health.
- Schools achieving these certifications demonstrate a commitment to reducing environmental impacts and creating healthier environments for students and staff (Ürük and İslamoğlu, 2019).

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2.1.3.2 Energy and Water Consumption Analysis Tools

Energy and water consumption play a significant role in a school's environmental footprint. Tools for analysis help schools optimize resource usage and identify cost-saving opportunities. The **Efficient and Healthy Schools Program**, led by the United States Department of Energy, provides a framework for sustainable building practices, renewable energy systems, and efficient technologies (United States Department of Energy, 2024).

Recommended tools include:

a. **Energy Monitoring Systems**

- Digital energy management systems track electricity, heating, cooling, and lighting usage. These systems generate reports on energy efficiency, helping schools identify areas for improvement.

b. **Smart Meters**

- Smart meters record real-time energy consumption, enabling schools to identify high-usage areas and implement energy-saving measures.

c. **Water Consumption Tracking Systems**

- Water meters and sensors collect data on water use in schools, helping to prevent waste and improve water efficiency.

2.1.3.3 Waste Management Analysis

Effective waste management is a cornerstone of the circular economy, transforming waste into resources. The **EU Waste Framework Directive** provides a structured approach to managing waste, prioritizing prevention, reuse, and recycling over landfill disposal (European Commission and European Parliament, 2008).

Key practices include:

- **Waste Tracking and Reporting**: Establish systems to monitor the type and volume of waste generated. This data informs strategies to reduce waste and improve recycling.

- **Recycling Activities**: Evaluate the use of recycling bins and practices within the school. Observations can guide efforts to increase recycling rates and reduce landfill waste.

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Figure 1 Five-step Waste Hierarchy for the management and disposal of waste within the EU Waste Framework Directive.Source:https://environment.ec.europa.eu/topics/waste-and-recycling/waste-framework-directive_en

Teachers and students can engage in the following practices:

a. **Waste Tracking and Reporting**

- Establish systems to monitor waste production by type (e.g., organic, plastic, paper).
- Track recycling rates and evaluate the effectiveness of strategies for reducing waste.

b. **Recycling Activities**

- Observe the usage and placement of recycling bins to identify areas for improvement.
- Develop targeted strategies to increase recycling rates and encourage proper waste disposal habits.

2.1.3.4 Biodiversity and Green Space Assessments

In 2020, the United Nations convened the **Biodiversity Summit** to address the global biodiversity crisis under the theme "People, Planet, and Prosperity." The summit emphasized nature-based solutions to challenges like climate change, deforestation, and ecosystem degradation, while calling for enhanced collaboration among governments, private sectors, and communities.

In this context, schools can assess the biodiversity and green spaces within and around their premises. These assessments not only highlight areas for ecological improvement but also contribute valuable data for long-term sustainability planning. Teachers and students can use the following tools:

a. **Geographic Information Systems (GIS)**

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- GIS technology combines hardware, software, and data to facilitate spatial analysis and decision-making.

- Schools can use public GIS platforms to conduct field studies, assess land use, and detect flora and fauna. Many public institutions offer free GIS tools to support educational initiatives.

2.1.3.5 Calculating Carbon Footprint

The **carbon footprint** is defined by the Turkish Ministry of Environment, Urbanization, and Forestry (2024) as "the total amount of greenhouse gas emissions associated with all activities of individuals, institutions, services, manufactured goods, and buildings," expressed in tons of CO_2.

- **Primary Carbon Footprint**: Emissions directly controlled by individuals or institutions, such as energy use, transportation habits, and consumption choices.

- **Secondary Carbon Footprint**: Emissions from the production, transportation, and disposal of goods and services, indirectly associated with consumption.

For example, using a plastic bag contributes to the primary footprint, while emissions from its production and disposal form part of the secondary footprint.

Teachers and students can calculate their school's greenhouse gas emissions from activities such as energy consumption, transportation, and waste using tools like the Carbon Trust Calculator. This data helps schools measure their environmental impact and identify areas for reduction.

2.1.3.6 Environmental Performance Index (EPI)

The **Environmental Performance Index (EPI)** is a comprehensive metric designed to evaluate the sustainability efforts of countries, institutions, and communities. Developed by Yale and Columbia Universities, the EPI measures progress toward environmental goals based on nine indicators and 19 variables, such as carbon footprint, energy efficiency, waste management, and biodiversity protection (Emerson, Hsu & Levy, 2012; Ünal & Polat, 2019).

Key features of the EPI include:

- Reducing environmental pressures on human health.

- Preventing the degradation of natural resource balances.

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- Measuring social and environmental responsibilities related to energy consumption, greenhouse gas emissions, and waste management.

Schools can use the EPI framework to assess their sustainability across multiple dimensions. Furthermore, they can utilize products recommended by organizations like the Global Ecolabelling Network, which evaluates the environmental impact of products across their lifecycle to promote sustainability.

2.1.4 Collaborative Solutions for Students & Teachers

Collaboration among students, teachers, and school leaders is vital for effectively identifying and resolving environmental challenges in schools. By working together, school communities can develop innovative, inclusive, and practical solutions that promote sustainability. Various methods enable schools to address these challenges collaboratively:

2.1.4.1 Surveys and Interviews

Surveys and one-on-one interviews allow members of the school community—administrators, teachers, students, parents, and staff—to share their perspectives on environmental challenges. This inclusive approach helps:

- Identify pressing environmental issues.
- Foster a shared understanding of priorities.
- Develop collective solutions that reflect the needs and values of the entire school community.

2.1.4.2 Sustainability Projects

Collaborative sustainability projects provide students with opportunities to critically analyse environmental problems and develop actionable solutions. These projects can focus on key areas such as:

- **Energy Conservation**: Initiatives to monitor and reduce energy use.
- **Recycling Programs**: Campaigns to increase recycling and waste separation.
- **Water Conservation**: Efforts to reduce water consumption and improve efficiency.
- **Air Quality Improvement**: Projects targeting air pollution through sustainable transportation or planting greenery.

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Such initiatives enhance problem-solving skills and foster teamwork among students, teachers, and staff (Greenpeace Türkiye, 2024).

2.1.4.3 Natural Learning Concept and Ecology Classes

Incorporating hands-on ecology classes into the curriculum enriches students' understanding of environmental science and sustainability. Through these classes, students gain:

- Practical training in areas such as agriculture, nature conservation, and environmental management.
- Skills to research, analyse, and interpret data related to environmental issues.
- Opportunities to develop and implement sustainability projects within the school and local community.

Ecology classes encourage experiential learning, fostering a deeper connection between students and the natural world (Doğa Schools, 2024).

2.1.4.4 Sustainability Awareness Activities

Organizing workshops, seminars, and thematic events on sustainability promotes awareness and engagement across the school community. Examples of impactful activities include:

- **Thematic Days**: Hosting events on "World Environment Day," "Water Footprint Day," or "Earth Overshoot Day" to educate and inspire students.
- **Family Engagement**: Student-parent days that involve collaborative activities focused on sustainability.
- **Educational Workshops**: Seminars addressing specific environmental topics, such as climate action or waste reduction.

Such initiatives not only enhance environmental knowledge but also strengthen cooperation among students, staff, and parents (Kapadokya Üniversitesi, 2024).

Example: "Being a Part of Sustainable Nature" Event

The annual "Being a Part of Sustainable Nature: Foreign Guests to Our Planet, Garbage" event, organized by Doğa Schools in 2024, exemplifies the power of sustainability awareness activities. This event engages students and staff in discussions and hands-on activities that explore the

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impacts of waste on the environment. By integrating creative approaches and interactive participation, the event fosters both learning and community spirit.

Figure 2 "Being a Part of Sustainable Nature: Foreign Guests to Our Planet, Garbage" event organized annually by Doğa Schools in 2024.

Source: https://www.dogakoleji.k12.tr/doga-dan-haberler/surdurulebilir-doganin-bir-parcasi-olmak-1-43532

2.2 Conducting Research

2.2.1 Steps for Preliminary Research

Conducting research on environmental issues in schools serves a dual purpose: raising awareness and equipping both educators and students with the knowledge and skills to develop sustainable solutions. Research empowers school communities to address environmental problems by fostering solution-oriented thinking and collaborative action.

Scientific research is a systematic process aimed at achieving specific objectives. It can be categorized into **basic research**, which contributes to the body of knowledge, and **applied research**, which focuses on solving specific problems (Yaşar, 1998). Both types are valuable in addressing environmental issues in schools.

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Key steps in conducting research include:

1. Determining the Research Topic

Identify a prominent environmental issue relevant to the school or community, such as water conservation, energy use, recycling, air pollution, or waste management.

2. Defining the Research Purpose

Clarify the significance of the identified issue and frame a focused research question, e.g., "How can we increase electricity savings in our school?" This step provides direction and establishes the intended outcome of the research.

3. Reviewing the Literature

Conduct a review of previous studies, projects, and initiatives related to the topic. Sources include:

- Books and academic articles.
- Online platforms and reports detailing successful environmental initiatives.
- Databases of case studies on school-based environmental actions.

4. Determining the Research Method and Data Collection

Choose appropriate methodologies for gathering and analysing data. Examples include:

- **Observation**: Examine specific areas like water taps, electronic devices, or recycling bins to monitor usage and habits.
- **Measurements**: Track water consumption over time or categorize types and volumes of waste generated.
- **Questionnaires**: Gather insights into the school community's awareness and practices regarding environmental issues.
- **Interviews**: Consult local education authorities or environmental organizations to gain detailed information on causes, policies, and best practices.

5. Analysing and Evaluating Data

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Systematically organize and classify the collected data. Analyze the data to determine the scope, prevalence, and impact of the identified problem. For instance, calculate energy savings potential based on observed usage patterns or survey results.

6. Interpreting Results and Findings

Identify the factors contributing to the environmental problem and assess its potential effects on the school community and the environment. Use data-driven insights to draw meaningful conclusions.

7. Presenting Recommendations

Share research findings with students, teachers, and administrators to raise awareness and foster engagement. Offer practical, sustainable solutions based on the research outcomes, such as:

- Implementing energy-saving measures.
- Establishing recycling initiatives.
- Promoting water conservation programs.

Scientific research must be reported systematically to ensure clarity, credibility, and usability. This involves:

a) Using a scientific and ethical approach to organize findings, discussions, and recommendations.

b) Adhering to internationally accepted standards for format, structure, and content (YÖK, 2014).

c) Presenting results in a way that is accessible and actionable for the intended audience.

By following these steps, school communities can conduct meaningful research that leads to actionable insights and fosters a culture of environmental responsibility. This structured approach not only builds environmental literacy but also empowers students and educators to take informed, solution-oriented action.

2.2.2 Information Sources for Research

Teachers and students have access to a wide range of resources to research environmental data, sustainability analyses, scientific studies, and educational materials. These resources are invaluable

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for gaining a comprehensive understanding of environmental and sustainability issues, fostering critical thinking, and raising environmental awareness within the school community.

Key sources include:

2.2.2.1 Government and Environmental Agencies

a) **Ministries of Environment, Urbanization, and Climate Change**

Government ministries play a pivotal role in shaping environmental policies, initiating projects, and preventing pollution. Their responsibilities include:

- Preparing and implementing environmental protection plans.
- Sharing data, reports, and research on environmental issues via official websites.
- Coordinating with other governmental and non-governmental organizations to foster sustainability.

  These resources provide localized insights into environmental challenges and initiatives, serving as a critical tool for school-based research.

b) European Environment Agency (EEA)

The **EEA** supports EU environmental legislation and contributes to Europe's transition to sustainability by providing data, analysis, and policy insights. Its work spans environmental indicators, biodiversity, climate change, and air quality.

Key features of the EEA include:

- Collaborating with 38 countries through the European Environment Information and Observation Network (Eionet).
- Publishing environmental reports and data at European, regional, and global levels.

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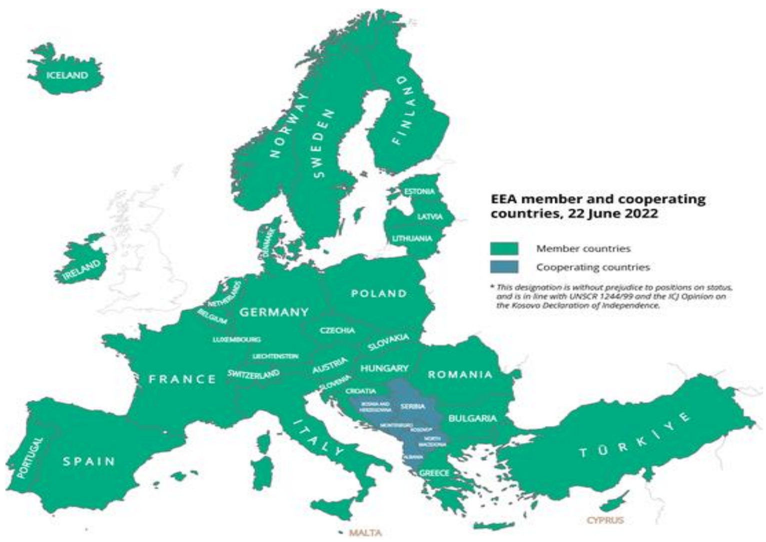

Figure 3 EEA member and cooperating countries, 22 June 2022 Source: https://www.eionet.europa.eu/

For further details: [European Environment Agency]()

c) Environmental Protection Agency (EPA)

The **EPA** is a federal agency in the United States dedicated to environmental protection and public health. Its key missions include:

- Monitoring air and water quality.
- Managing waste and conserving natural resources.
- Researching environmental issues and providing guidance on sustainable development.

The EPA also organizes public awareness programs and shares environmental reports and analyses. Visit: [US Environmental Protection Agency]()

d) United Nations Environment Programme (UNEP)

Founded in 1972, the **UNEP** promotes global environmental awareness and action. Its primary goals include:

- Supporting governments in creating and implementing environmental policies.
- Addressing global challenges such as climate change, biodiversity loss, and pollution.

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- Providing up-to-date research and reports on issues like biodiversity and the United Nations Sustainable Development Goals (SDGs).

The UNEP's comprehensive resources are crucial for achieving sustainability goals. Learn more: [United Nations Environment Programme]

Figure 4 United Nations Sustainable Development GoalsSource: https://sdgs.un.org/goals

For details on the SDGs: Sustainable Development Goals

e) **Municipal Environmental Reports and Activities**

Local municipalities play a significant role in implementing environmental policies and raising public awareness. Key activities include:

- Publishing reports on pollution, biodiversity, green spaces, waste management, and energy consumption.

- Hosting events and festivals to promote sustainability and community engagement.

Municipal reports provide valuable data for schools, detailing local environmental conditions, plans, and goals. These documents foster collaboration and enable schools to align their initiatives with broader municipal strategies.

2.2.2.2 International Climate and Sustainability Databases

Accessing reliable, comprehensive databases is critical for understanding global environmental challenges and developing informed sustainability strategies. Teachers and students can leverage

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these international platforms to enhance their research, gain insights into climate dynamics, and identify actionable solutions.

a. Intergovernmental Panel on Climate Change (IPCC)

The **IPCC** is a United Nations agency established in 1988 by the United Nations Environment Programme (UNEP) and the World Meteorological Organization (WMO). Its mission is to provide policymakers with unbiased, scientifically grounded information on climate change, including its causes, impacts, and mitigation strategies.

Key Functions:

- Assessing the causes of global warming, atmospheric gases, and changes in the climate system.
- Evaluating the impacts of climate change on ecosystems, agriculture, water resources, and human health.
- Recommending solutions such as reducing greenhouse gas emissions, adopting renewable energy, and developing sustainable technologies.

Key Publications:

The IPCC regularly publishes **Assessment Reports** and **Special Reports** that serve as foundational references for global climate policy. Notable examples include:

- *Global Warming of 1.5°C* (2018).
- *Climate Change and Land Use* (2019).
- *Special Report on Oceans and Ice Sheets* (2019).

In 2007, the IPCC was awarded the **Nobel Peace Prize** for its groundbreaking contributions to climate science.

For detailed reports and resources, visit: Intergovernmental Panel on Climate Change

b. NASA Earth Data

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NASA Earth Data is a portal offering real-time observational data from NASA's Earth Science Division. It provides access to atmospheric, biosphere, oceanic, glacial, and terrestrial data, enabling users to monitor, understand, and address environmental and climatic changes.

Applications:

- Climate change modeling and prediction.
- Monitoring natural disasters and supporting crisis management.
- Enhancing agricultural practices and food security.
- Tracking air quality and pollution.
- Studying ocean dynamics and rising sea levels.

The portal's **Earth Observing System Data and Information System (EOSDIS)** collects and disseminates data to researchers, educators, and decision-makers globally.

Explore the data: [NASA Earth Data Portal]

For visual exploration, use the **NASA Earth Data Worldview Interface**: [NASA Worldview]

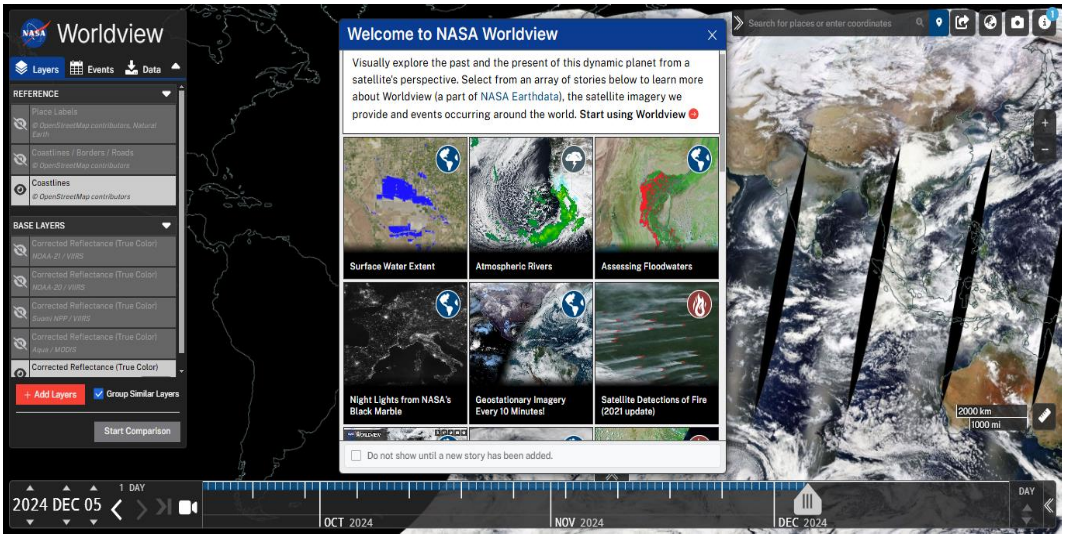

Figure 5 NASA Earth Data Worldview InterfaceSource: [https://worldview.earthdata.nasa.gov/]

c. Global Footprint Network (GFN)

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The **Global Footprint Network (GFN)**, established in 2003, is an international research organization dedicated to measuring humanity's ecological footprint and promoting the sustainable use of natural resources.

Key Contributions:

- **Ecological Footprint Analysis**: Measures how human activities consume nature's resources and compares this consumption to Earth's capacity for renewal.
- **Biocapacity Assessment**: Evaluates the planet's ability to replenish resources and identifies sustainable living thresholds for countries, regions, and individuals.
- **Earth Overshoot Day**: Annually highlights the date when humanity's resource consumption surpasses Earth's capacity for the year.

Reports and Campaigns:

GFN provides actionable reports and data-driven insights on renewable energy adoption, sustainable consumption patterns, and ecosystem preservation. It also works with governments to develop long-term sustainable development strategies.

Visit GFN: Global Footprint Network

2.2.2.3 Scientific Article and Publication Databases

Accessing peer-reviewed, reliable, and comprehensive academic resources is critical for educators and students aiming to deepen their understanding of environmental and sustainability topics. The following platforms and databases provide essential tools for conducting rigorous academic research:

a. State and University Library Databases

State and university libraries serve as indispensable hubs for academic and applied research. They provide access to a wealth of digitized resources on environment and sustainability, contributing to individual and societal awareness and solutions.

Through their digital archives, researchers can access:

- Scientific studies on environmental science, climate change, and renewable energy.
- Peer-reviewed articles from international journals.

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- Undergraduate, graduate, and doctoral theses.
- Printed and digital books on topics like environmental management and sustainability.
- Reports published by national and international organizations.

These archives are available through the websites of state and university libraries, offering an invaluable resource for teachers, students, and researchers alike.

b. Google Scholar

Google Scholar is a widely-used search engine providing access to academic literature, including scholarly articles, theses, dissertations, books, and conference proceedings. Developed in 2004, it is an essential tool for anyone seeking academic resources.

Key Features:

- Search by keywords or full article titles.
- View all citations for a specific article.
- Access open-access resources directly for free.
- Save preferences and receive notifications about specific topics by signing in with a Google account.

For more, visit: [Google Scholar]

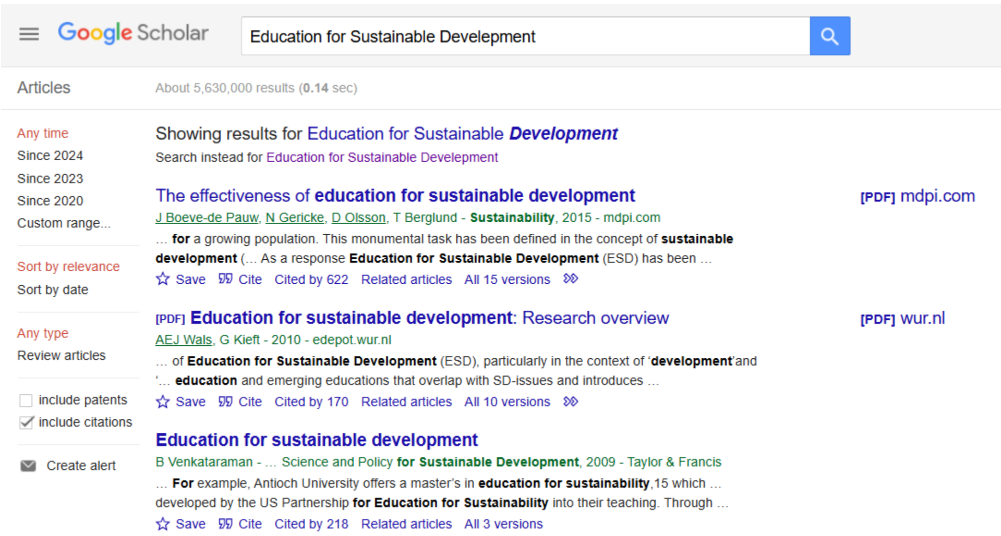

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Figure 6 Google Scholar Search Engine InterfaceSource: https://scholar.google.com/

c. ScienceDirect & JSTOR

1. **ScienceDirect**
   A digital library platform by Elsevier, **ScienceDirect** provides access to a vast collection of scientific content, including over 2,500 peer-reviewed journals and 40,000 e-books. Its focus spans disciplines such as engineering, medicine, biology, chemistry, physics, and social sciences, making it a trusted resource for educators and researchers.

Explore ScienceDirect: ScienceDirect

2. **JSTOR**

Founded in 1995, **JSTOR** is a digital archive platform offering academic journals, books, primary sources, and rare historical content. It covers a wide range of disciplines, including history, social sciences, economics, and literature. JSTOR's digitized archives provide access to rare, older sources, ensuring their preservation and accessibility.

Explore JSTOR: JSTOR

d. ResearchGate & Academia

ResearchGate and **Academia** are academic social networks designed for researchers to share knowledge, collaborate, and connect.

Key Features:

- Share and access scientific articles, research projects, and results.
- Establish interdisciplinary or international collaborations.
- Upload academic profiles, including publications and research interests.
- Request articles directly from other researchers.
- Track the readership and download statistics of uploaded publications.

For more, visit:

- ResearchGate
- Academia

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2.2.2.4 Education and Resource Platforms

Education and resource platforms play a crucial role in supporting teachers, students, and institutions in fostering environmental awareness and integrating sustainability into learning. The following platforms offer comprehensive resources to enhance environmental education:

a. National Geographic Educational Materials

The **National Geographic Educational Materials** platform, developed by the National Geographic Society, provides resources for teachers, students, parents, and educational institutions. Covering a wide range of topics, including nature, science, history, geography, and culture, this platform serves as a valuable tool for education at all levels.

Key Features:

- Comprehensive lesson plans tailored for subjects like geography, biology, and environmental science.
- Documentaries, short videos, and photo galleries that bring global environmental challenges to life.
- Articles addressing pressing topics such as climate change, biodiversity, and sustainability.
- Resources for research projects, classroom activities, and curriculum development.

This platform is ideal for teachers crafting lesson content, students conducting research, parents seeking educational materials, and institutions building sustainability-focused curricula.

Visit the platform: [National Geographic Education Materials]

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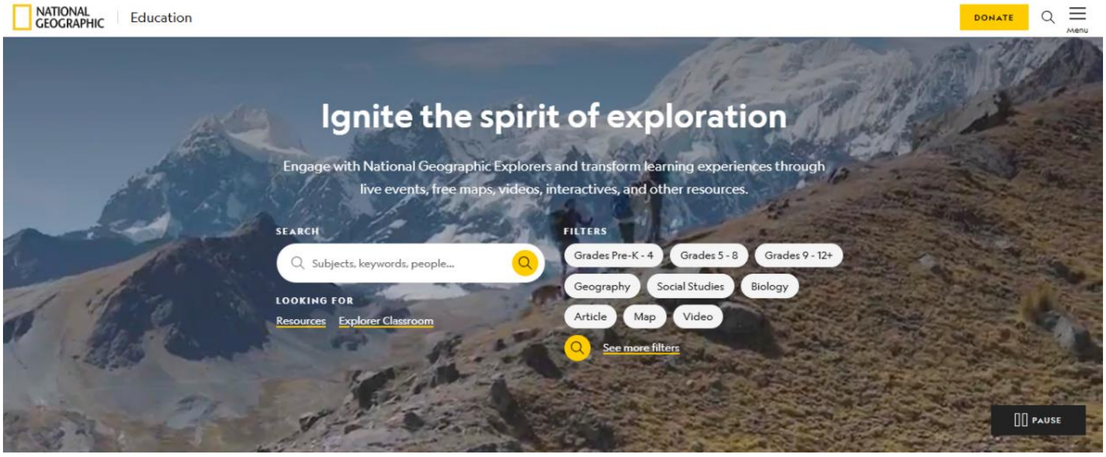

Figure 7 National Geographic Education Home PageSource: https://education.nationalgeographic.org/

b. WWF Education Programs

The **World Wide Fund for Nature (WWF) Education Programs** aim to raise global environmental awareness by teaching individuals, particularly children and young people, about nature conservation and sustainable living.

Key Features:

- Teacher guides covering topics like environmental awareness, climate change, biodiversity, and sustainability.
- Visual materials such as posters and drawing cards to help students explore environmental concepts.
- Educational games, virtual activities, and online training modules on themes like marine life, forest conservation, and climate action.
- Ecological Literacy Programs explaining ecosystem functions and relationships.
- Community-Based Project examples tailored to local environmental challenges.

These resources are designed for educators, students, parents, and community groups seeking to develop environmentally friendly habits and foster sustainable practices.

Explore WWF resources: [WWF Teaching Resources]

c. Teachers Academy Foundation (ÖRAV)

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The **Teacher Academy Foundation (ÖRAV)** is a non-governmental organization in Turkey focused on the professional and personal development of educators, with a strong emphasis on environmental awareness.

Key Features:

- Environment-focused training programs and workshops, such as Sustainable Living Trainings and Climate Change Workshops.
- Open-access teaching materials, including lesson plans, eco-friendly teaching practices, posters, and booklets.
- Interactive and practical resources to equip teachers with environmentally friendly habits and a deeper understanding of climate issues.

By providing these tools, ÖRAV empowers teachers to inspire their students and promote environmental stewardship in schools and communities.

Visit ÖRAV: Teacher Academy Foundation

2.2.2.5 Open Access Data and GIS Resources

Access to reliable geographic and environmental data is essential for understanding and addressing sustainability challenges. The following open access and GIS tools provide educators, students, and institutions with cutting-edge resources for research, analysis, and decision-making:

a. Global Forest Watch (GFW)

Global Forest Watch (GFW) is a dynamic, open monitoring platform developed in 2014 by the World Resources Institute (WRI). It provides real-time information on global forest conditions, enabling users to monitor forest loss, detect deforestation, and support sustainable forest management.

Key Features:

- Utilizes satellite imagery, GIS, and big data technology to provide detailed insights into forest status.
- Tracks forest cover changes, monitors forest fire risks, and estimates carbon emissions from deforestation.

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- Offers tools for governments, NGOs, and the private sector to collaborate on forest conservation policies.

GFW has become an essential tool for protecting forests globally, supporting collective efforts toward a sustainable future.

Explore GFW: [Global Forest Watch]

Interactive map interface: [GFW Map]

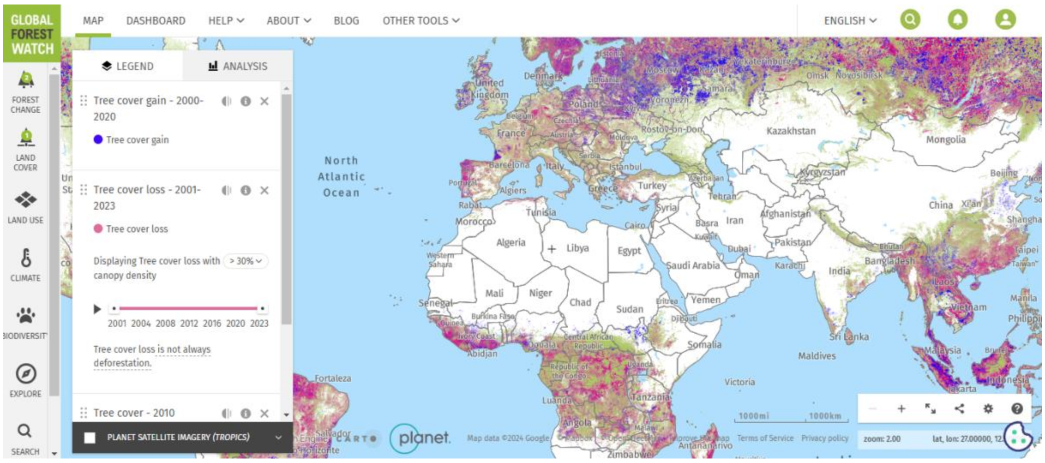

Figure 8 Interactive World Forest Map & Tree Cover Change Data Interface of GFWSource: [https://www.globalforestwatch.org/map/]

b. OpenStreetMap (OSM)

OpenStreetMap (OSM) is a collaborative, open-source mapping platform established in 2004 to collect, organize, and share geographic data worldwide. It enables users to contribute and update a variety of geographic features such as roads, natural areas, and buildings.

Key Features:

- Offers detailed maps of cities, transportation routes, natural areas, and rivers.
- Supports rapid mapping during emergencies, urban planning, environmental management, and logistics.
- Provides free geographic data for various applications, from navigation systems to commercial projects.

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With its community-driven approach, OSM ensures that accurate, up-to-date, and comprehensive geographic data remains accessible to all.

Visit OSM: [OpenStreetMap]

c. ArcGIS Online

ArcGIS Online is a cloud-based GIS platform provided by Esri, enabling users to create and share maps, conduct geographic analysis, and manage diverse datasets.

Key Features:

- Creates interactive maps to visualize geographic data and analyze trends such as population density and risk management.
- Displays dynamic, time-sensitive data like weather patterns, traffic flows, and demographic changes.
- Compatible with desktop GIS applications and mobile devices for seamless usage.

ArcGIS Online supports data-driven decision-making across various sectors and is invaluable for projects requiring geographic visualization and analysis.

Explore ArcGIS Online: [ArcGIS Online]

d. EU Copernicus Program

The **Copernicus Program** forms the Earth observation component of the European Union Space Program. Managed by the European Commission, it leverages satellite data and in-situ measurements to provide real-time insights into global environmental conditions.

Key Features:

- Offers free, openly accessible data and services for monitoring land, ocean, and atmospheric conditions.
- Supports local, regional, and global research needs with near real-time observations.

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- Partners with leading organizations like ESA, EUMETSAT, and the European Environment Agency (EEA) to deliver high-quality data.

The program enhances understanding of Earth's systems, enabling sustainable management of resources and informed policymaking.

Learn more about Copernicus: EU Copernicus Program

Explore the Copernicus Atmosphere Monitoring Service: CAMS

Figure 9 The Copernicus Atmosphere Monitoring Service (CAMS)Source: https://atmosphere.copernicus.eu/

2.2.2.6 NGOs and Environmental Organizations

Non-governmental organizations (NGOs) play a critical role in addressing global environmental challenges, promoting conservation, and advancing sustainability practices. Below are key organizations whose resources and initiatives can support schools and communities in fostering environmental stewardship.

a. World Wide Fund for Nature (WWF)

Founded in 1961, the **World Wide Fund for Nature (WWF)** is one of the largest and most influential environmental organizations globally. Initially established as the World Wildlife Fund, the organization rebranded to its current name in 1986, though the original name is still widely used in some countries.

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Objectives and Focus Areas:

- Protects biodiversity and promotes the sustainable use of natural resources.
- Reduces pollution and waste while supporting renewable energy and sustainable development.
- Establishes marine and terrestrial protected areas for endangered species and habitats.
- Advocates for and collaborates on environmental protection laws and sustainable food production.

Notable Global Campaigns:

- *Earth Hour*: A global movement to raise awareness about climate change.
- *Living Planet Report*: Regular reports on the state of the planet's ecosystems.
- *Sustainable Seafood Initiative*: Efforts to promote responsibly sourced seafood.

Learn More: [WWF Official Website]

b. Greenpeace

Established in 1971 in Canada, **Greenpeace** is an independent environmental NGO known for its bold activism, campaigns, and commitment to sustainability. It addresses critical environmental issues through direct action, lobbying, and public engagement.

Key Objectives:

- Promotes the adoption of renewable energy and reductions in fossil fuel use.
- Advocates for international agreements to combat global warming.
- Protects forests, marine ecosystems, and endangered species.
- Challenges practices harmful to ecosystems, including pollution and resource depletion.

Notable Campaigns:

- *Save the Arctic*: Opposing oil exploration in Arctic regions.

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- *Stop Sea Dumping*: Combating plastic pollution in oceans.
- *Detox Campaign*: Addressing the use of toxic chemicals in the textile industry.

Explore More: [Greenpeace International]

Annual Reports: [Greenpeace Annual Reports]

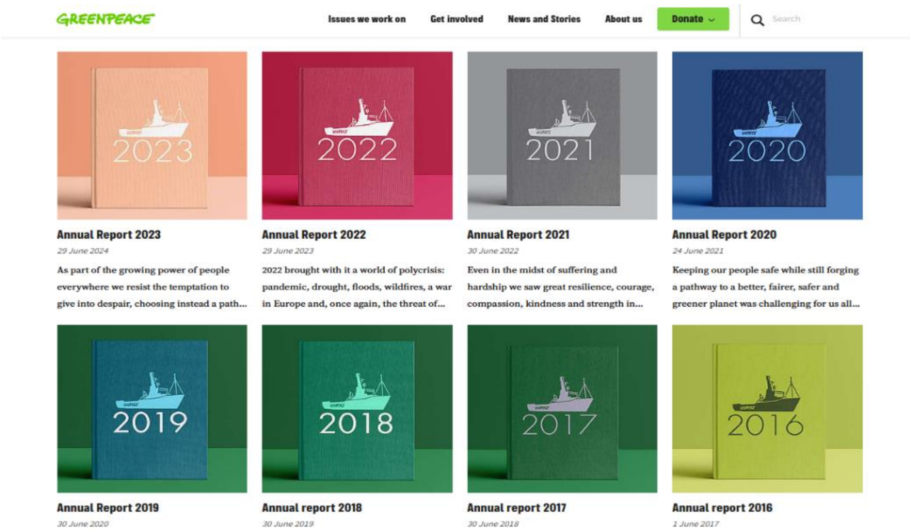

Figure 10 Annual Reports of Greenpeace Source: https://www.greenpeace.org/international/about/annual-report/

c. International Union for Conservation of Nature (IUCN)

Founded in 1948, the **International Union for Conservation of Nature (IUCN)** is a leading global authority on nature conservation and sustainable resource management. With over 1,300 members, IUCN operates at local, national, and international levels through a vast network of partners.

Key Programs and Contributions:

- **IUCN Red List**: Comprehensive assessments of species' conservation status worldwide.
- **Protected Areas Program**: Initiatives to expand and sustain conservation zones.
- Development of global nature conservation strategies and environmental policies.

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- Organization of the *World Nature Council* to promote international consensus on conservation efforts.

Learn More: [IUCN Official Website]

d. TEMA Foundation

The **TEMA Foundation** (Turkish Foundation for Combating Erosion, Reforestation, and Protection of Natural Habitats), established in 1992, is a prominent Turkish NGO dedicated to protecting natural resources, combating erosion, and fostering biodiversity.

Major Activities and Projects:

- **Reforestation Campaigns:** Prevents erosion, reduces carbon emissions, and enhances soil fertility.
- **Environmental Education Programs:** Engages students and teachers in combating deforestation and climate change.
- **Biodiversity Conservation:** Protects endangered species and natural habitats in Türkiye.
- **Public Awareness Campaigns:** Includes *Breath for the Future*, which has led to the planting of millions of trees.

TEMA is actively involved in creating a culture of environmental responsibility through educational materials, workshops, and school programs, aiming to inspire the younger generation.

Visit: TEMA Foundation

Watch: "What is Climate Change?" TEMA Video

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Figure 11 TEMA Foundation "What is Climate Change?" YouTube Video Source:
https://youtu.be/aGYjEyHBUTA?si=_gF8B3vxkmCpF3xT

2.2.3 Data Collection and Analysis Methods

Understanding and addressing sustainability challenges in schools begins with rigorous data collection and thoughtful analysis. This process not only generates insights but also inspires students, teachers, and administrators to approach environmental issues with curiosity and a solution-driven mindset. By adopting a structured approach, school communities can ensure their research leads to meaningful and impactful outcomes. Below are steps and methods that guide this process.

1. Identifying Objectives and Establishing the Framework

Every successful study begins with a clear purpose. Schools need to define the specific environmental issues they aim to address—whether it's reducing energy use, improving recycling rates, or monitoring water consumption. Establishing this focus ensures that efforts are well-directed and aligned with broader sustainability frameworks.

- **Example Framework:** The United Nations Sustainable Development Goals (SDGs) offer a comprehensive blueprint for tackling environmental and social issues, providing schools with global benchmarks for their initiatives (United Nations, 2015). These goals inspire research themes ranging from combating climate change to fostering responsible consumption.

2. Selecting Data Collection Methods

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The choice of data collection methods shapes the depth and breadth of the insights gathered. School communities can use a combination of techniques tailored to their specific context:

- **Surveys and Interviews:** By engaging students, teachers, and staff, schools can uncover habits and perceptions related to environmental issues such as energy use and waste management (Bryman, 2012). Broader surveys involving the surrounding community can expand the scope of the research (UNEP, 2014).

- **Field Studies:** Observations of school ecosystems, energy usage, and waste management systems offer firsthand data, fostering a hands-on understanding of environmental conditions.

- **Literature Reviews:** Accessing academic publications and research databases, such as Google Scholar, provides valuable context and comparative insights.

- **Official Reports:** Reliable data from organizations like the IPCC and Eurostat enhance the credibility of findings and facilitate deeper analysis (Hart, 1998).

3. Comparing and Validating Data

Data reliability is critical to creating actionable recommendations.

- **Validation Technique:** The triangulation method allows researchers to cross-check data from multiple sources and perspectives, ensuring a comprehensive and balanced understanding of the issue (Denzin, 1978).
This process not only builds trust in the findings but also encourages collaboration among school stakeholders.

4. Data Analysis and Visualization

Analyzing data is where the story begins to unfold, revealing patterns and relationships that inform solutions:

- **Quantitative Analysis:** Regression analysis, for instance, can explore relationships between variables like energy use and school occupancy rates (Field, 2013). Alternatively, Life Cycle Analysis examines the environmental impacts of processes or products, from inception to disposal (Ministry of Environment, Urbanization, and Forestry, 2023).

- **Qualitative Analysis:** Content analysis dives into reports and documents, uncovering recurring themes and underlying insights (Krippendorff, 2018).

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- **Visualization Tools:** Presenting findings effectively is as important as uncovering them. Tools like Tableau and Power BI transform raw data into clear, visually engaging narratives, enabling stakeholders to grasp complex issues at a glance (Few, 2012).

5. Ethical Principles and Transparency

Ethics and transparency are the cornerstones of credible research. Involving students, staff, and the wider school community in an open and respectful manner fosters trust and encourages active participation.

- **Informed Consent:** Obtaining consent, particularly from minors, and anonymizing data ensures that privacy is maintained (MoNE, 2024).

- **Rigorous Referencing:** Proper citation and documentation of all sources, from academic articles to interviews, not only enhance credibility but also encourage further exploration of the topic (TÜBİTAK, 2024).

By following these steps, schools can cultivate a culture of inquiry that empowers their community to engage with sustainability challenges in meaningful ways. From clarifying objectives to presenting data visually, this process transforms abstract concerns into actionable strategies, paving the way for lasting environmental impact.

2.2.4 Documenting Findings for Future Reference

Proper documentation is essential to ensure the continuity of research efforts and to provide a reliable foundation for future studies. As Bryman (2012) emphasizes, well-documented studies enhance both the consistency and credibility of the information gathered. For schools embarking on environmental and sustainability research, adopting systematic approaches to documentation is critical not only for maintaining accuracy but also for empowering future researchers to build on their work.

The Importance of Documentation in the Digital Age

Advancements in information technologies and the rise of the digital age have transformed how we manage and document knowledge. Schools, as institutions of learning and innovation, must embrace modern information policies and strategies to protect and organize research outputs. By establishing such systems, schools can safeguard the integrity, accessibility, and confidentiality of documents while ensuring that research findings remain a valuable resource for future use (Özdemir, 2017).

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Practical Strategies for Effective Documentation

1. **Institutional Information Policies:** School administrations can implement clear policies and strategies for managing research findings. Utilizing cloud storage systems, such as **Google Drive**, **OneDrive**, or **Dropbox**, ensures secure and centralized access to documents. These platforms, when managed by IT staff, provide reliable digital archives for sustainability-related research and projects (Few, 2012).

2. **Standardized Documentation Practices:**

   - **Research Diaries:** Maintaining a research diary helps record findings systematically throughout the research process.

   - **Classification:** Clearly label findings as qualitative or quantitative and ensure consistency in file naming. Use standardized titles that include the subject, date, and content description (Krippendorff, 2018).

   - **File Formats:** Store finalized documents in PDF format to maintain their integrity and protect them from unintentional edits. Supplement these documents with graphs, maps, diagrams, and multimedia records (e.g., MP3 or MP4 formats) for a more comprehensive repository.

3. **Accessible Archives:** Whenever feasible, findings should be shared on **open access platforms** to contribute to broader societal knowledge and foster collaborative learning (United Nations, 2015). Additionally, physical archives, such as libraries or dedicated school spaces, can store printed reports, documents, and projects. Assigning school librarians or designated personnel to manage these resources ensures proper categorization and long-term accessibility.

Supporting Academic Rigor

Encouraging adherence to international academic writing standards, such as **APA** or **MLA**, enhances the professionalism of the research outputs (American Psychological Association, 2020). Workshops on academic writing and documentation methods can help students and teachers alike understand the value of presenting findings systematically and clearly. Providing standard templates for reports and data visualization also simplifies this process and creates uniformity across projects.

Fostering a Culture of Documentation

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Documenting findings should not be seen merely as a technical requirement but as a valuable part of the research journey. By organizing short training sessions on effective documentation techniques, schools can inspire students to appreciate the role of well-maintained records in advancing knowledge. Standardized practices and accessible archives ensure that each project contributes to a cumulative body of work, paving the way for sustained progress in environmental and sustainability research (Bryman, 2012).

2.3 Setting Goals and Objectives

2.3.1 Translating Challenges into Goals and Objectives

A strong goal is a clear, motivating, and achievable objective that serves a specific purpose. Effective goals not only provide direction but also foster engagement and shared understanding among those working toward them. In schools, transforming data and solutions gathered from research on sustainability into well-defined goals ensures actionable results (Kerzner, 2017). Achieving sustainability goals requires strategic planning, collaboration, and measurable targets. By addressing the following key steps, schools can ensure their efforts are focused and impactful:

2.3.1.1 Identification of Environmental Problems and Findings

Thorough research is the foundation for setting meaningful goals. To identify core environmental problems—such as water pollution, insufficient recycling, or energy inefficiencies—a rigorous literature review and systematic investigation are essential (Bryman, 2012; Subaşı & Okumuş, 2017).

The findings from these investigations help schools understand their current circumstances and the root causes of the issues they face. Tools like SWOT analysis (Strengths, Weaknesses, Opportunities, and Threats) can be instrumental in evaluating the data. This method provides a clear picture of a school's internal capacities and external challenges, enabling stakeholders to prioritize areas for action (Özan et al., 2015).

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Figure 12 "What's in a SWOT Analysis?" TemplateSource: https://www.bitesizelearning.co.uk/resources/swot-analysis-explained-examples-templates

2.3.1.2 Setting Clear Goals and Objectives

Goals should be ambitious and long-term, aiming to address fundamental problems sustainably. Objectives, by contrast, are more immediate, measurable milestones that support the overarching goals. For instance, a goal might be to "promote energy-efficient behaviors in the school community," while an objective could specify "reducing annual electricity consumption by 20%."

A helpful framework for creating strong objectives is the SMART criteria: Specific, Measurable, Achievable, Relevant, and Time-bound (Doran, 1981). This ensures that objectives are clearly defined and actionable. For example:

- **Goal:** Increase awareness of water conservation in the school community.
- **Objective:** Decrease water consumption in shared facilities by 15% within one academic year.

Aligning school projects with the United Nations Sustainable Development Goals (SDGs) adds depth and global relevance to these efforts. For instance, SDG 13 – Climate Action encourages actions such as strengthening resilience to climate-related hazards and raising awareness of climate change (United Nations, 2015). Adopting this framework allows school communities to contribute to broader sustainability targets while fostering localized engagement.

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Figure 13 SMART Goals TableSource: https://www.indeed.com/career-advice/career-development/how-to-write-smart-goals

Integrating environmental education into the curriculum and employing project-based learning approaches can ensure that the school community gains the necessary knowledge and skills to adopt and support these objectives effectively (Blumenfeld et al., 1991).

2.3.1.3 Strategic Planning

Strategic planning is essential to transform sustainability aspirations into actionable outcomes. Schools must assess their current capacities, adapt to changing environments, and chart a clear path toward achieving their goals. A strategic plan should include a vision for the future, along with an assessment of strengths, weaknesses, opportunities, and threats (Özan et al., 2015).

Collaboration is crucial in this process. A participatory approach that includes teachers, students, parents, and local stakeholders ensures diverse perspectives and fosters collective ownership of sustainability efforts (Freeman, 1984).

For strategic planning to be effective, it must outline:

- Available resources.
- Clear timelines for each goal.
- Well-defined roles and responsibilities for every member of the school community.

By involving the entire school community, strategic planning becomes a shared journey that strengthens commitment and ensures progress toward environmental sustainability (Kerzner, 2017).

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2.4 Preparing a Concept

2.4.1 Components of an Effective Environmental Initiative

Developing successful environmental initiatives in school communities begins with accurately identifying problems and defining clear, measurable objectives to address them. Teachers and students must design a robust concept that outlines goals, the scope of planned activities, and anticipated outcomes (Sterling, 2011). This process ensures clarity and alignment among stakeholders and creates a foundation for impactful projects.

Defining Goals and Addressing Gaps

The first step in concept preparation is to define the project's goals clearly. This includes identifying specific gaps or challenges, understanding their causes, and determining who is affected within the school community. Comprehensive literature research on the project topic can uncover deficiencies in existing studies and provide insights into best practices. Involving stakeholders in this process ensures the inclusion of diverse perspectives and strengthens the relevance of the project.

Tools for Analysis and Planning

1. **SWOT Analysis**: Conducting a SWOT (Strengths, Weaknesses, Opportunities, Threats) analysis with input from the school community helps to identify environmental challenges, stakeholder needs, and potential limitations (Özan, 2015). This method ensures a holistic understanding of the context in which the project will operate.

2. **SMART Objectives**: Goals should align with SMART criteria—Specific, Measurable, Achievable, Relevant, and Time-bound (Doran, 1981). For instance, instead of setting a vague goal like "reduce energy use," a SMART objective would be "reduce the school's annual energy consumption by 15% within the next academic year."

3. **Logical Framework Matrix (Log Frame)**: The Log Frame is a widely used tool in international development projects, offering a structured approach to project design and evaluation (Uusikylä & Valovirta, 2007). It defines project objectives, expected outcomes, and activities while summarizing key results. The Log Frame also includes an "Assumptions" column to identify and manage potential risks, enhancing project planning and communication among stakeholders (Sartorius, 1991).

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Intervention Logic	Verifiable Indicators	Sources of Verification	Assumptions
Overall Objectives The longer-term benefits to beneficiaries and wider benefits to other groups	Measures to verify to what extent the overall objective is fulfilled	Data sources for indicators for overall purpose	
Project Purpose Benefits to be received by the project beneficiaries or target group	Measures to verify to what extent the project purpose is fulfilled	Data sources for indicators for project purpose	Important events, conditions or decisions outside the control of the project which must prevail for the overall objective to be attained
Results Services to be delivered to the intended beneficiaries or target group	Measures to verify to what extent the results are produced	Data sources for indicators for results	Important events, conditions or decisions outside the control of the project management, necessary for the achievement of the project purpose
Activities The activities that have to be undertaken by the project in order to produce the outputs	Inputs Goods and services necessary to undertake the activities		Important events, conditions or decisions outside the control of the project management, necessary for the production of the results
			Preconditions

Adapted from European Commission (1999)

Figure 14 The Logical Framework Matrix (Uusikylä & Valovirta, 2007) Source: https://www.researchgate.net/figure/The-Logical-Framework-matrix_tbl1_249743970

Community Participation and Leadership

Broad participation within the school community enhances project success. Encouraging students to take leadership roles and supporting their efforts through workshops and educational programs on environmental issues foster deeper engagement and learning (Tilbury, 2011). A collaborative environment ensures that the initiative is both inclusive and empowering.

Local and Global Perspectives

Effective environmental initiatives address local challenges while considering global implications. For instance, a project aimed at reducing single-use plastics in schools could also educate participants about global plastic pollution. Collaborations with local governments, environmental NGOs, and businesses can amplify the initiative's reach, providing resources and fostering community-wide impact (Barr, 2003).

Communication and Dissemination Strategies

A strong communication plan is essential for raising awareness and ensuring participation. Utilizing a mix of strategies such as social media campaigns, posters, newsletters, and regular events like "Environmental Awareness Days" can engage broader audiences both within and beyond the school community (Chawla & Cushing, 2007). Effective communication ensures the initiative's visibility and encourages sustained support.

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By combining these components, school communities can develop well-prepared concepts for environmental initiatives that are actionable, inclusive, and impactful. These approaches not only address pressing environmental issues but also cultivate a culture of sustainability and shared responsibility within the school and its surrounding community.

2.4.2 Brainstorming Innovative Environmental Ideas

Developing innovative concepts for environmental issues and sustainability within school communities requires a dynamic approach that blends creativity with practical applications. Brainstorming, a method popularized by Alex Faickney Osborn in 1961, is an effective way to generate diverse ideas by encouraging open dialogue and uninhibited thinking. This process fosters collaboration and helps groups explore creative solutions to environmental challenges while mobilizing the school community (Öztürk, 2009).

The Brainstorming Method: A Pathway to Innovation

Brainstorming is a structured yet flexible technique designed to enhance creative thinking and idea generation. It allows individuals or groups to generate a broad range of ideas without fear of criticism. During the initial stages, all suggestions are welcomed, regardless of how unconventional they may seem. This non-judgmental environment encourages participants to share their thoughts openly, creating a space where ideas can evolve and inspire one another (Mentzer et al., 2015).

Sample Topics and Ideas for Brainstorming in Schools

Here are some examples of brainstorming topics that school communities can explore, accompanied by innovative ideas to address environmental challenges:

a. Smart Waste Management and Recycling Applications

- **Idea:** Develop mobile applications to promote recycling habits among students, teachers, and the wider community. Incorporate gamified elements like points, badges, and leaderboards to encourage participation.
- **Impact:** Engage tech-savvy youth and foster a competitive spirit to increase recycling rates.
- **Reference for Inspiration:** United Nations Environment Programme (UNEP), Turning Waste into Resources: Digital Solutions for Waste Management, 2019.

b. Micro Green Areas and Urban Agriculture

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- **Idea:** Identify unused spaces within cities and transform them into community gardens or micro-agricultural zones. Encourage sustainable practices like vertical farming on school rooftops and gardens to enhance food security and reduce carbon footprints.
- **Impact:** Promote urban greening and environmental awareness while improving local food production.
- **Reference for Inspiration:** Food and Agriculture Organization (FAO), Urban Agriculture: Food for Cities, 2019.

c. Zero Waste School Project

- **Idea:** Create a comprehensive Zero Waste program for schools that includes prohibiting single-use plastics, establishing waste segregation stations, and creating composting areas.
- **Impact:** Foster sustainable living habits among students and set a model for the wider community.
- **Reference for Inspiration:** World Wildlife Fund (WWF), Schools for Sustainability: Engaging Youth in Zero Waste Practices, 2020.

d. Use of Environmentally Friendly Technology

- **Idea:** Design a digital tool to help users calculate their carbon footprint, identify unsustainable habits, and recommend eco-friendly alternatives.
- **Impact:** Increase individual awareness and encourage environmentally conscious decisions through technology.
- **Reference for Inspiration:** Chawla, L., & Cushing, D. F. (2007). *Education for Sustainable Development in Schools.*

e. Renewable Energy Education Projects

- **Idea:** Launch STEM-based workshops where students design and implement renewable energy systems like solar panels or wind turbines.
- **Impact:** Equip students with technical skills while fostering awareness of renewable energy solutions.

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- **Reference for Inspiration:** Sterling, S. (2012). *The Future Fit Framework: An Introductory Guide to Teaching and Learning for Sustainability in HE.*

f. Social Mobility and Environmental Festivals

- **Idea:** Organize events such as Environmental Festivals featuring workshops, exhibitions, and other community activities to promote sustainable lifestyles and raise awareness of local environmental issues.

- **Impact:** Build societal engagement and foster collective environmental action.

- **Reference for Inspiration:** Barr, S. (2003). *Strategies for Sustainability: Citizens and Responsible Environmental Behaviour.*

Brainstorming within school communities not only facilitates innovative solutions to pressing environmental issues but also fosters collaboration, critical thinking, and active participation. These activities inspire students and staff to become proactive agents of change, contributing to both local and global sustainability efforts.

2.4.3 Turning Environmental Ideas into Project Proposals

Students and teachers can transform the ideas and innovative concepts they have developed on environmental challenges within their school communities into an effective project proposal. With these projects, they can contribute to raising awareness, changing behaviour and environmental challenges within the school community with a whole-school approach to sustainability and environmental issues, as well as participating in various national and international project competitions or partnership programmes to ensure that their ideas on sustainability are evaluated and disseminated in an academic framework (Brown, 2021).

In the process of transforming these ideas and innovative concepts into scientific project proposals, it is of vital importance that these proposals have certain steps to be followed and that these proposals have certain standards that comply with academic norms, that correct scientific data collection and analysis methods are used, that the extent to which the specified objectives are achieved can be measured and the results are interpreted, that in-text references obtained from the researches are included, and that they have bibliographies (Sterling, 2011).

For students and teachers to turn their ideas and innovative concepts about environmental challenges into projects, there are templates available for various institutions' programmes and national/international project competitions. These templates help teachers and students to present

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their projects in a more organised and professional approach. Resources such as UNESCO Training Materials (https://www.unesco.org/en/education), which provide guidelines for environmental projects; the Erasmus+ Programme Platform (https://erasmus-plus.ec.europa.eu/), which shares examples of successful implementation of environment and sustainability themed projects; and the Sustainable Development Goals (SDG) Toolkits (https://www.undp.org/), which include guides and documents prepared by the United Nations for environmental issues, can help teachers and students in preparing projects.

Teachers and students who want to prepare a project proposal in compliance with academic norms can benefit from the criteria and project writing template of the 2204-B Secondary School Students Research Projects Competition, which has been organised by the Scientific and Technological Research Council of Türkiye (TÜBİTAK) annually since 2007, which aims to encourage secondary school students to carry out studies in the fields of basic, social and practical science and to contribute to the development of their existing scientific studies (TÜBİTAK, 2024).

You can find the template in the Annex to the TÜBITAK scientific research project report template

2.5 Planning Activities and Timelines

2.5.1 Steps for Planning Activities with a Timeline

According to Ersoy (2007), planning can be defined as the process of preparing necessary and systematic action programmes for the future to achieve the desired goals and objectives. Unlike prediction, planning is a thinking process that uses logic and imagination together to achieve the desired goals and expected results.

The planning stage is of critical importance for the effectiveness of the activities to be carried out in educational institutions and the realisation of the educational, administrative or school community goals of the schools. Planning can be regarded as a preparation process for implementation, and the involvement of those who will implement the plan in the decision-making phase is necessary to achieve the objectives and success (Ereş, 2004).

It is essential for teachers and students who want to start an environmental initiative in schools to plan the activities to be carried out within the scope of this initiative in detail and to set goals that will produce sustainable results while taking concrete steps to solve environmental problems. A well-planned environmental initiative should include purposeful and effective activities. It is necessary to correctly identify social and regional needs, to prioritise the participation and benefit of all stakeholders in the activities to be carried out with an inclusive approach, to set measurable

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goals and to observe sustainability criteria for all activities to have long-term effects on the environment and society (TÜBİTAK, 2022).

Proper planning not only ensures the success of the initiative but also increases environmental and social awareness and creates wider positive impacts. Therefore, it is important to follow some basic steps in planning an effective environmental initiative and activities within the school community:

a. Identifying Problems and Setting Goals: The first step of the initiatives to be planned for environmental problems in schools is to identify the problems correctly. The environmental problem to be studied should be analysed comprehensively and its causes, effects and scope should be determined. In addition, the regions and communities most affected by the identified problem should also be identified. Considering the level of awareness of the school community about these problems, a clear goal or goals should be set to solve these problems, and measurable objectives should be set in this direction. The measurability of the objectives is critical to ensure that the initiative is successful, sustainable and achieves effective results (UNESCO, 2019).

b. Determining the Participants, Target Groups and Resources: Determining who will be responsible for which responsibilities, which target groups the activities will be carried out for, and which resources will be used is critical for the completion of the projects and achievement of their goals. Considering that there are limited resources for environmental initiatives in schools, wrong target group selection or inadequate planning may lead to waste of resources and failure of the project. In addition, the resources that stakeholders such as municipalities or non-governmental organisations, which will contribute to the project activities outside the school community, can provide technical support, expertise, etc. should also be determined at the planning stage of the initiative (Erdem & Çelik, 2021).

c. Determination of Activities: In projects to be carried out within the scope of an initiative, specific tasks and activities to be carried out within the school community (awareness-raising activities for energy saving, workshops and seminars for raising environmental awareness, designing visual materials, etc.) should be determined. While planning all of these activities, it should be ensured that they are in accordance with the project goal, measurable and feasible (TÜBİTAK, 2022).

d. Creating a Timetable: In the process of planning their environmental initiatives, teachers and students should prepare a timetable detailing the time required for the realisation of each task and activity. The start and end dates and the sequence of each task and activity should be determined, and options that allow sufficient time for possible delays should be included in this timeline (Köroğlu, 2020).

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In determining a timetable, teachers and students should exchange ideas to determine how long each phase of the project will take to complete. Periods such as course schedules, exam periods, official holidays, and the work schedules of the people who will be involved in the project should be considered when determining the timetable. In addition, interim reporting periods during which the planned activities within the scope of the project will be checked at regular intervals should also be considered when planning the timetable.

e. <u>Implementation and Monitoring of the Project:</u> While the planned activities are carried out, the process should be regularly monitored and evaluated. In this way, it can be observed to what extent the project has been successful in line with its purpose and objectives. In addition, necessary improvements can be made during the project process by collecting feedback from the participants regarding these activities during the project. Without monitoring, it is impossible to understand the impact of the project and detect problems.

e. <u>Evaluation of Results and Reporting:</u> Upon completion of the project, a report should be prepared for evaluating the results obtained. This report identifies the successes and shortcomings of the project and can guide future projects. The evaluation and reporting of results constitutes a critical step in the effective management of environmental initiatives, the improvement of learning processes and the provision of guidance for future projects. This process not only measures the success of an initiative but also increases accountability to stakeholders and enables continuous improvement in the context of environmental challenges. Furthermore, reporting increases opportunities for funding and collaboration for future projects by building transparency and trust (MoNE, 2021).

2.5.2 Ensuring Effective and Inclusive Planning

Instilling environmentally conscious behaviours in future generations depends on expanding environmental awareness among students and developing sustainable practices through the implementation of environmental projects. These initiatives go beyond simply transferring theoretical knowledge and facilitating the acquisition of environmentally conscious habits in students' daily lives. Considering some basic factors in planning initiatives and projects aimed at solving environmental problems in schools is important to attract students' attention, develop sustainable behaviours and increase environmental awareness.

a. <u>Suitability of School Programmes:</u> Integration of environmental issues into the school curriculum helps students to understand issues related to environmental problems and sustainability. Providing environmental education to students from an early age in schools helps students to develop their environmental awareness as individuals from an early age and helps them

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to adapt to sustainable behaviours and develop appropriate behaviours while helping to make environmental awareness permanent (Tilbury, 1995).

In addition, further integration of interdisciplinary environmental issues into school courses enables students to approach environmental problems from different perspectives and improves their evaluation skills. Active learning methods such as project-based learning and inquiry-based learning increase students' participation in the process and positively affect learning outcomes. In addition, the alignment of school curricula on environmental programmes ensures that environmental issues are taught in a standard and consistent manner among different teachers and schools (Sterling, 2010).

b. <u>Participatory Approaches:</u> Instead of just providing information, the planned initiative activities related to environmental problems should be designed for the active participation and responsibility of the whole school community, especially students. Students and other stakeholders within the school community who take an active role and take responsibility with participatory approaches increase their awareness of environmental problems and reflect this in their daily behaviour, get to know environmental problems more closely and learn the ways to solve these problems (Jensen & Schnack, 1997).

b. <u>Local Community and Family Involvement:</u> The active participation and awareness of local stakeholders outside the school community in the activities within the scope of these initiatives also contributes to the realisation of sustainable development goals by ensuring that environmental problems are understood by much wider masses, that the projects carried out are owned by the local community and continue in the long term, and that social solidarity and collective awareness are increased (Barratt Hacking et al., 2007).

b. <u>Motivational Factors:</u> For environmental initiatives to be successful, activities that motivate students and the school community, as well as local stakeholders who will participate in the implemented projects, increase interest in environmental problems and projects developed to solve them, and make participation sustainable. Introducing students to environmental issues in fun and creative ways, such as workshops, outdoor activities, competitions and reward systems, will increase their motivation for the projects.

Similarly, seminars, expert trainings, brochures, social media materials and public awareness videos can help local stakeholders and the community to better understand the importance of environmental challenges. Activities such as tree planting, beach clean-ups, nature trekking, and mobilising activities such as recycling campaigns also strengthen the stakeholders' sense of

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belonging, increase participation, and increase the chances of success of the projects in achieving their goals (UNESCO, 2020).

e. Use of Technology: Digital tools and technologies are one of the most powerful instruments today for promoting participation and developing sustainable solutions by enabling projects developed for environmental challenges to reach large audiences thanks to the increasing use of technology and skills of individuals and society, raising social awareness, involving the reached groups in initiatives on environmental issues, enabling more effective and widespread co-operation.

Digital platforms can be used to publish information videos on environmental challenges, offer training programmes and interactive content. In addition, user-friendly mobile applications that encourage direct participation in environmental projects can be developed. In project planning and implementation processes, the data obtained can be safely stored, online surveys and forums can be used to obtain the opinions of the participants and can be used in the preparation of interim reports on projects (Evans et al.,2017).

f. Cultural and Local Sensitivity: If the initiatives planned in schools focus on local environmental problems and needs, it creates a sense of belonging for the students and the school community, who are part of that environment, as the subjects addressed directly contribute to their daily lives, making it possible for the projects to be more meaningful and owned. Projects that focus on local environmental challenges, which are designed by considering the socio-economic and cultural conditions in the local area where the school is located, rather than general or universal subjects, offer more sustainable solutions and have a higher potential for success.

Projects focusing on local environmental challenges raise environmental awareness among the community in the area, helping individuals to develop environmentally friendly behaviours in their daily lives. The phenomenon of social solidarity among individuals who come together to solve a common challenge is strengthened and collective co-operation increases (Stevenson, 2007).

2.5.3 Allocating Resources and Responsibilities

Schools are institutions with limited resources and these limited resources should be allocated effectively and they should not be wasted in the initiatives to be planned for an environmental challenge. Correct and effective planning and allocation of resources enables the completion and success of the projects developed in schools regarding an environmental problem by using the limited time, budget and human power in the most efficient way. Inadequate management of the allocation of resources increases the risk of failure in the implementation steps of the project, decreasing the quality of the project outputs and increasing the risk of not achieving the planned project objectives (Kerzner, 2022).

Correctly determining the responsibilities of the project team increases the performance and cooperation of the team by eliminating uncertainties and time losses about the responsibilities of the team members by ensuring that everyone in the team clearly and accurately understands their own duties, and facilitates assessment and evaluation processes (Tuner, 2016; Lock, 2020).

Therefore, it is important to pay attention to the following points in the allocation of resources and distribution of responsibilities in environmental initiatives and projects to be carried out by a school community:

a. Identifying and Mapping Resources: During the planning phase of an environmental initiative, teachers and students should accurately determine what resources are available within the school community and the local stakeholders who will support the project, and assess what, if any, gaps exist and how to overcome these gaps.

The resources that can be used within the scope of a project can be classified as material resources such as financing and tools needed for project implementation; human resources such as school community members, local stakeholders and experts who will participate in the project; natural resources such as plants, solar energy, etc. that can be obtained directly from the school environment (UNESCO, 2019).

b. Efficient Allocation of Resources: While designing an environmental project, resources should be allocated to high-priority objectives or urgent actions among the project activities. It is important that the project budget has a transparent financial structure and that unnecessary expenditures are not made on non-essential items that are not needed. Utilising the resources of municipalities, local communities, NGOs within the scope of the project, or providing sponsorship agreements in cooperation with the private sector will also reduce project costs (Erdem & Çelik, 2021).

b. Distribution of Duties and Responsibilities: The tasks and responsibilities to be undertaken by everyone who will take part in the project during the project process should be clearly defined. These tasks and responsibilities should be allocated to the participants in accordance with their skills, expertise and capacities. The use of tools such as task tables covering the project process and the tasks to be fulfilled ensures that everyone involved in

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the project has a clear understanding of their tasks and facilitates collaboration and follow-up among the project team (MoNE, 2021).

b. Communication and Coordination: High solidarity and coordination, which are the key elements for the success of the work of the project team that will carry out a project, depend on good organisational communication between team members. Organisational communication is a binding process that ensures the cooperation and harmony of people who come together around a common purpose. Establishing an effective communication approach from the stage of allocating resources and determining the responsibilities of team members within a project team will increase the coordination among team members, organise the activity processes, reduce unnecessary repetitions and help to increase productivity (Atak, 2005).

The difficulties encountered by the members of each team responsible for carrying out a project while fulfilling their duties should be listened to and necessary arrangements should be made. In addition, teachers and students should organise regular meetings to evaluate the progress in the project process and solve potential problems (Köroğlu, 2020).

e. Project Monitoring and Evaluation: Monitoring and evaluation should be considered and included in the project during project planning to ensure that responsibilities and resources are used correctly. Monitoring and evaluation show the stage of the project regarding the problem that is desired to be changed. Monitoring is done by comparing the initial status information of the indicators selected from the factors that best represent the change with the information from certain periods to measure the changes in the project. Evaluation is the stage where the results obtained from monitoring are interpreted, information and experience are shared and new ideas are created. Monitoring and evaluation processes are of critical importance for recording the progress in the projects and eliminating deficiencies (TÜBİTAK, 2022; Sivil Toplum Geliştirme Merkezi, 2024).

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3 Connecting

Community engagement is emerging as a pivotal factor in the pursuit of environmental sustainability. By building strong partnerships with local stakeholders, schools can have a greater impact, mobilise easier resources and foster the sense of responsibility for the environment. This chapter explores the theoretical background of community engagement and offers practical steps for community engagement in the context of school environmental sustainability initiatives.

In particular, it presents typical key stakeholders in the local community that can support such initiatives, criteria that should be used to identify these stakeholders, as well as tools and methods that can be used for stakeholder mapping. Furthermore, this chapter showcases a series of steps that should be taken to initiate contact and build relationships with potential partners, while offering tips on the essential elements of an effective communication strategy for engaging stakeholders. Inspiring initiatives to overcome environmental challenges are also discussed. The aim is to equip educators and school leaders with the knowledge and tools needed to achieve a successful community engagement.

3.1 Mapping Local Community Stakeholders

Providing a definition of “community” is often challenging, as the term has been interpreted in multiple ways over the years. A community can have many different forms, encompassing both the physical space of a neighbourhood and a set of relationships (Hardy & Grootenboer, 2016; Sanders & Galindo, 2014). When a community is seen as a neighbourhood, it represents the shared environments where individuals live and connect. On the other hand, when community is considered as a set of relationships, it transcends physical space, uniting different groups and individuals with common interests or connections. This is extremely important when it comes to connecting with local community stakeholders in order to enhance the effectiveness of school environmental sustainability initiatives.

In particular, community involvement can be seen as a process that includes different stages of participation, collaboration and shared decision–making (Schiavo, 2021). The main beneficiaries of this process are the communities themselves, as they gain greater ownership over their actions. The community can create new power dynamics and inspire policy and practice innovation. A “bottom-

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up approach" is crucial for a meaningful community involvement, as the members of the community participate then in the designing of new policies and practices and in the decision-making process (Schiavo, 2021). Furthermore, it is also evident that individuals now may join multiple communities in different parts of the globe at the same time, given the advancement of Information and Communication Technologies (ICTs) (Watkins & Russo, 2005). The significance of these facts for the educators lies on equipping them with tools and knowledge to involve their communities and the broader educational environment in their activities to effectively address the growing environmental challenges within the school or school community.

To start with, the journey to become a sustainable/green school includes the community engagement as a fundamental milestone. This involves engaging a wide range of stakeholders, such as parents, local businesses, social enterprises, environmental organisations or groups, as well as environmental experts/professionals, local authorities, charities, media representatives, and other community members (e.g. residents, activists, and volunteers) and neighbouring educational institutions (UNESCO, 2024). That scale of collaboration enables the implementation of bigger projects, offers better access to resources, and extends the sphere of influence of sustainable initiatives developed by the school. Figure 1 presents a list with possible key stakeholders in the local community.

Possible key stakeholders in the local community

- Students
- School staff
- Local businesses
- Social enterprises
- Parents
- Environmental organisations or groups
- Local authorities
- Environmental experts/professionals
- Charities
- Media representatives
- Other community members (e.g. residents, activists, and volunteers)

Figure 15 Possible stakeholders

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Projects engaging schools and local community actors to promote innovative practices, offer space for the exchange of good practices and ideas that can be implemented for the benefit of the entire community. Specifically, school-community partnerships expose learners (and schools) to local knowledge facilitating the alignment of sustainability actions with the specific needs, concerns, and values of the community, making them more relevant and effective (European Commission, 2023). The integration of school- and community-based knowledge holds considerable potential for fostering school-community partnerships (Hausburg, 2024). Nevertheless, most school-community engagement/collaboration initiatives described in academic literature focus on building student's understanding of or for their community instead of promoting the co-creation of knowledge with the community members (ibid).

According to Hausburg (2024), there are three different approaches to be considered when it comes to knowledge-building:

- **Knowledge of Community**: community members are seen as rich sources of information for students to learn from. It includes strategies like conducting interviews with community members or inviting local guest speakers to discuss relevant topics.
- **Knowledge for Community**: community members are positioned as recipients of students' learning. Service Learning and Youth Participatory Action Research initiatives often take this form, supporting students as they work to address local issues on behalf of their communities (e.g., Mirra et al., 2015).
- **Knowledge with Community**: community members are considered as co-creators of knowledge, fostering mutual learning. Service Learning and the establishment of Community Action Groups that involve both students and community members in collaborative efforts align with this approach.

The figure below illustrates the differences among these three approaches.

	Engagement		Collaboration	
		Knowledge of community	Knowledge for community	Knowledge with community

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Directionality	Who is giving information?	Community members	Student	Student and community members
	Who is receiving information?	Student	Community members	Student and community members
Purpose	What is the purpose?	Students' learning	Community's learning	Mutual learning

Figure 16 Figure 2: Directionality and purpose of knowledge exchangeSource: Adapted from Hausburg, 2020

It is important to clarify that by integrating Service Learning into action-oriented learning frameworks, educators can further enhance the experiential learning process by ensuring that student actions are directed towards meaningful community service, thus fostering a sense of civic responsibility. Service Learning can be defined as 'a course-based, credit-bearing educational experience in which students (a) participate in mutually identified and organized service activities that benefit the community, and (b) reflect on the service activity in such a way as to gain further understanding of course content, a broader appreciation of the discipline, and an enhanced sense of personal values and civic responsibility' (Bringle and Clayton, 2012).

The literature defines three elements that characterise a Service Learning project as distinguished from volunteering, internship, or community service (Opazo et al, 2023):

1. the students are the main characters of the learning and solidarity action;
2. the service developed intentionally responds to a real need of a community; and
3. the service developed must be articulated with the curricular contents.

In this link you can learn more about the concept of Service Learning and how to start a Service Learning Project in 10 steps (Koslowsky et al., 2023).

Moving on to the criteria set in order to create a comprehensive map of potential stakeholders as you plan for engagement, consider how critical stakeholder investment is to the success of the school initiatives. In this link you will find a tool developed by Katie Rouse (2020) that can help you map and plan you community engagement events. A preview of this tool is also presented in the annex.

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3.2 Building Partnerships

This part discusses and visualises the proposal for a local school community engagement model in 10 simple steps, in order to help you to initiate contact and build relationships with potential partners.

Step 1: Define the topic and scope of school community events

Research highlights the advantages of setting predefined topics of discussion and/or guiding questions to structure stakeholder engagement (OECD, 2020; OECD, 2022). Predefined objectives and/or guiding questions facilitate the collection and analysis of findings and recommendations from local school community engagements to inform even policy making and planning at the national level (OECD, 2023). These objectives and/or guiding questions could for example be predefined by school principals, teachers, students, parents (ibid). However, allowing schools to operate without predefined objectives or questions can help surface context-specific issues and challenges relevant to the local school community.

Step 2: Determine the duration, timing and frequency of the school community engagements

After defining the focus or open nature of the engagements, school communities must establish their duration, timing and frequency (OECD, 2023). First time events usually have longer engagement (e.g., full-day), while in the established communities require shorter engagements (up to three-four hours). Concerning the timing (and frequency) of school community engagements, events during the working week and school hours seem to be more feasible, allowing for student and teacher participation, while at least two or three engagement events annually are suggested to enhance participation (ibid).

Step 3: Select a format that suits the school community context

School community engagement events can either have in-person, online or hybrid format based on the readiness of the school community. In-person meetings foster informal interactions, trust-building and confidence (OECD, 2023). However, they come with logistical challenges (e.g., venue, catering and transportation). An online format can reach on the other hand a broader audience (e.g., working parents or those living in remote areas) (ibid). A hybrid approach can be also selected to balance the advantages of both methods.

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Step 4: Find a venue for in-person or hybrid school community engagement events

The next step is to select a suitable venue to accommodate participants. This can include for example events within the school or the use of existing public facilities, such as community centres, libraries, public halls, universities and community spaces (OECD, 2023). Prefer spaces that are accessible and affordable and foster a sense of inclusion.

Step 5: Provide skilled facilitation

The school community engagement events may be also facilitated by a voluntary small team of external, independent facilitators who are not part of the school community (e.g., from universities, non-governmental organisations or private companies), as this could allow for more open discussions (OECD, 2023). School principals and teachers can be trained as well to become facilitators with the support of a range of resources (e.g., facilitation guidelines and tools). Last but not least, the role of students as peer facilitators could also be explored (ibid).

Step 6: Integrate school community engagement event(s) into the school calendar

Effective planning is important to ensure that stakeholder events are added to the school calendar. School communities may also consider to align these events with existing school activities (e.g. School open days, parents' meetings, etc.) (OECD, 2023).

Step 7: Communicate with and invite participants

Effective communication can increase the opportunities for public learning and encourage greater participation in school community engagements (OECD, 2020; OECD, 2021; Suiter and Fletcher, 2020). reach out to the members of the school community once the date, timing and location of the events are confirmed. Use different means of communication to reach the community, such as the school email, website or apps, websites and social media accounts of local libraries and community organisations, etc. (OECD, 2023). Include information about the event's purpose, time, location, and the overall school community engagement.

Step 8: Focus on the preparation of participants and facilitators

Information sharing in the school community engagement model can lead to participants taking informed decisions (OECD, 2020). students, parents and other members of the school community shall know what school improvement efforts have been undertaken recently and what other actions may be considered for the coming months and years (e.g., to enhance the effectiveness of school

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environmental sustainability) (OECD, 2023). Students' voices are crucial in the school community engagement discussions and help shape concrete recommendations for action (ibid).

Step 9: Hold the school community engagement event

With all the preparations in place, school communities can proceed to engage in the actual stakeholder event. Insights from other projects emphasize the importance of delivering materials and activities in clear, accessible language to ensure meaningful participation from everyone involved (Department of Children and Youth Affairs, 2015; Beaudoin, 2013; Council of Europe: Committee of Ministers, 2012). Building trust should be a priority for the organisers and facilitators, while the use of online technologies can help increase and enable participation (OECD, 2023). Some digital, interactive communication tools could allow for real-time written contributions from the participants are Mentimeter, AhaSlides, and Kahoot.

Step 10: Provide ongoing feedback and updates on actions

After the event, compile the key findings and action recommendations promptly. Tailor communications to different audiences, e.g., by creating separate versions for children, young people, and adults (OECD, 2023). Regular feedback loops sustain enthusiasm and support the implementation of agreed-upon actions. To institutionalize the suggested engagement model, schools could integrate event findings into the School Self-Evaluation and improvement planning processes (ibid). This approach ensures that improvement efforts are aligned with the priorities and actions identified by the school community, strengthening the communication and collaboration of schools with their communities.

The following list presents some methods that can be used to involve stakeholders in the planning and implementation of sustainable initiatives. According to UNESCO (2024), all the suggested eco-friendly actions can be taken within the context of school-community partnerships to cultivate a culture of sustainability:

- Organising **awareness campaigns** for the school and the surrounding community on the topic of climate change
- Creating of **informational materials** about the climate and sustainability issues
- Conducting **workshops or sessions with experts** about climate mitigation and adaptation
- Advocating for policy changes and organising of **action plans** to address climate change and other aspects of sustainability

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- Establishing of **community gardens**, **gardens with native plants** or **small-scale school farms** around/close to the school in collaboration with experts
- Coordinating community **clean-up activities**
- Implementing **surveys or needs assessments** to understand the environmental concerns and priorities and challenges faced by community members
- Facilitating **participatory research and problem-solving projects** related to community issues
- Arranging **field trips** to community spaces and resources (e.g. nature reserves, sustainable farms, eco-friendly industries and infrastructure facilities)
- Organizing annual or regular **community engagement events** such as eco-fairs, swap fairs, tree planting and clean-up campaigns and panel discussions on climate change and sustainability
- Running **competitions or challenges** about climate change and other aspects of sustainability, such as eco-art contests, energy/water-saving and waste minimization challenges
- Creating (online) **platforms** that facilitate resource sharing within the community
- Building **partnerships** with local businesses, organizations and agencies (including opportunities for volunteering, internships, job shadowing, etc.)

3.3 Communication Strategies

In this part you will discover the essential elements of an effective communication strategy for engaging stakeholders. Figure 3 can help you prioritise efforts in engaging the stakeholders and plan the activities based on the level of support the various stakeholders are likely to provide (Rouse, 2020).

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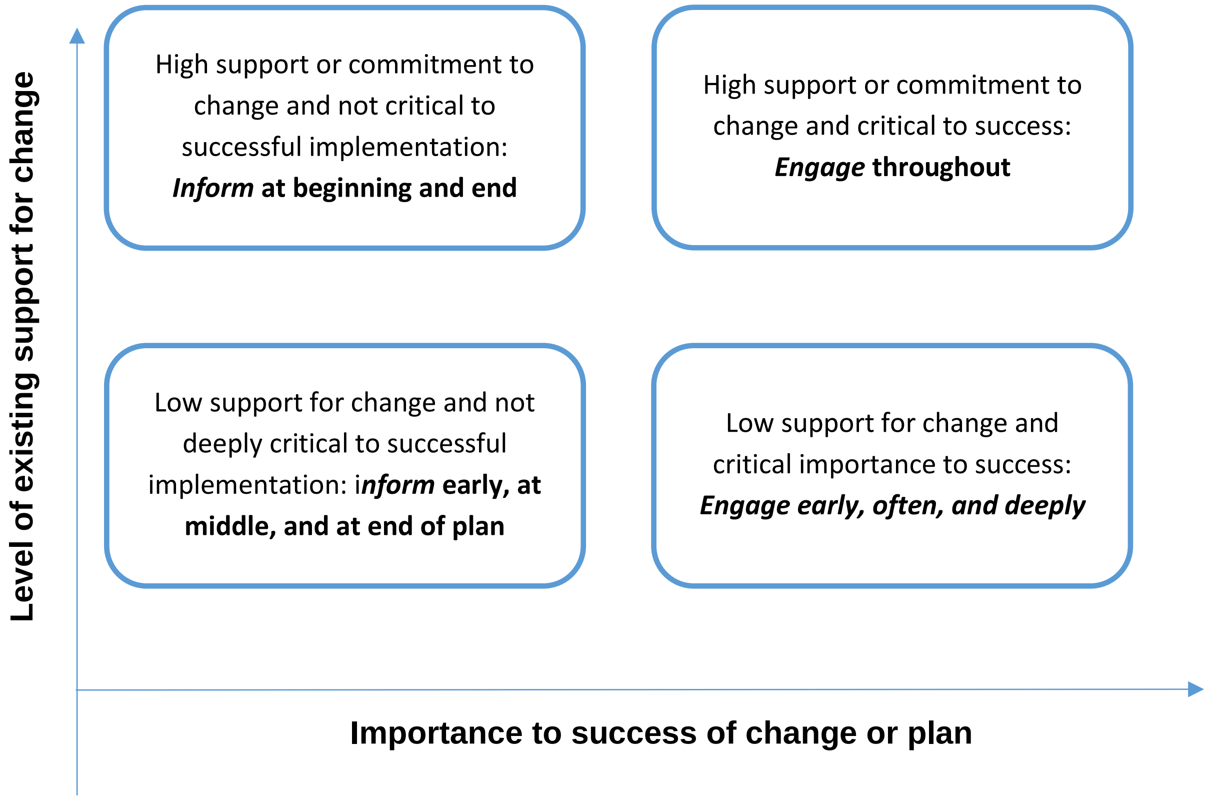

Figure 17 Proposed engagement approach in planning stakeholder engagement Source: Adapted from Rouse, 2020

To better choose the communication technique to reach your audience, the following questions should be also considered (Jaansoo, 2019):

- Familiarity: To what extend do you understand the issue and the stakeholder(s) involved? What has the relationship been in the past? What research and preparatory work has been completed?
- Frequency: Is this engagement one meeting, a series of meetings, or an ongoing dialogue with no defined end?
- Guidance/Facilitation: who will facilitate this engagement process?

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- Participant Profile: Does the engagement involve a single representative, multiple from the same organisations, or representatives from many different organisations? Are these decision makers, affected or concerned citizens, parents, etc.?
- Complexity: Does the engagement focus on a single issue or multiple issues? What is the level of seriousness and the potential impacts?
- Trust/Credibility: What level of trust exists between you and the stakeholder(s)?

Remember that for a successful engagement, efficient messaging with the stakeholders includes the following actions (UNHCR, 2021):

- Write texts keeping your audience and their information needs in mind.
- Organise the message in a logical structure
- Avoid unnecessary details.
- Use conversational language as it is simpler.
- Be personal and direct in your tone
- Keep it short and simple and break longer information into short paragraphs.
- Avoid legal jargon and if terminology is necessary, provide explanations.
- Write out acronyms the first time they appear.
- Use examples to clarify complex concepts.
- Repeat the key points of the message.
- Give each piece of information its own heading or subheading.
- Include visuals (e.g., explanatory pictures, lists, and tables)

Moving on to what channels and tools can be used to disseminate information and updates about initiatives, as discussed previously school email, website or apps, websites and social media accounts of local libraries and community organisations, etc., are some to be considered (OECD, 2023). Nowadays, communication can take the form of physical or virtual meetings, be printed, recorded, broadcasted, sent by phone, email or social media platforms.

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4 Taking Action

Environmental sustainability in schools requires more than understanding challenges—**it demands bold, effective steps** to address them (Falk & Dierking, 2023). This chapter, "Taking Action," is the centerpiece of the handbook, offering practical strategies, tools, and examples to help schools turn their vision into reality. It focuses on moving from theory to action, guiding schools to implement meaningful sustainability initiatives.

Creating a sustainable school is a **collaborative effort** involving students, teachers, administrators, and the wider community (Davis & Jones, 2024). This chapter outlines a pathway for integrating sustainability into all aspects of school life, including operations, governance, curriculum, and community engagement. It highlights key areas such as aligning the school's mission and culture with sustainability goals, using a whole-school approach to engage stakeholders, and following a roadmap for planning, executing, and monitoring initiatives (Harris & Smith, 2024). Strategies for building collaborative teams, assigning roles, and fostering accountability are also explored, alongside practical tools, methodologies, and case studies that can be tailored to each school's unique context (Simmons et al., 2023).

Understanding sustainability is important, but **meaningful change comes from action**. Schools have the power to demonstrate how environmental challenges can be addressed through innovation, collaboration, and commitment (Thompson & Garcia, 2024). By adopting sustainable practices, schools reduce their ecological footprint and inspire students to become lifelong environmental advocates.

Taking action also creates opportunities to **empower students** by engaging them in hands-on projects that develop critical thinking and leadership skills. It strengthens community bonds by bringing together teachers, students, parents, and local organizations in shared sustainability efforts (Williams & Robinson, 2023). Moreover, real-world initiatives enrich education by connecting classroom learning to pressing global challenges.

This chapter equips schools at any stage of their journey with the tools, frameworks, and inspiration needed to transform sustainability from a concept into a lived practice. By taking action, your school can lead by example, becoming a model of environmental stewardship that inspires current and future generations to care for the planet.

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4.1 Applying a Whole-School Approach

4.1.1 What is a Whole-School Approach?

A Whole-School Approach to environmental sustainability integrates sustainable practices into all dimensions of a school's operations and pedagogy. Unlike isolated lessons or extracurricular activities, this method addresses sustainability as a core value, guiding decisions and actions across the entire institution (Tilbury, 2019).

This approach ensures that students not only learn about sustainability but also experience it in practice. By connecting theoretical knowledge with real-world applications, the Whole-School Approach helps students develop the skills, attitudes, and behaviours necessary to become active stewards of the environment (UNESCO, 2022).

Key areas of integration include:

- **Governance:** Sustainability is embedded in the school's vision, mission, and policies, ensuring long-term commitment and alignment with the institution's core values (Centre for Green Schools, 2024).
- **Curriculum:** Interdisciplinary lessons incorporate environmental themes, enabling students to understand the interconnectedness of social, economic, and ecological systems (Davis & Jones, 2024).
- **Operations:** Schools model sustainability through waste reduction, energy conservation, and green procurement policies (Australian Department of the Environment and Heritage, 2006).
- **Community Engagement:** Schools act as hubs of environmental action, fostering partnerships with local organizations, businesses, and other stakeholders (Sustainability Directory, 2024).

In practice, this approach transforms schools into vibrant learning environments where sustainability is both taught and lived.

4.1.2 Key Elements

A Whole-School Approach comprises several interconnected elements, each contributing to a cohesive and effective sustainability framework:

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1. **Leadership and Vision:** Leadership plays a crucial role in championing sustainability. A clear, shared vision provides direction and inspires collective action. Inclusive leadership ensures that all members of the school community, from students to staff, are engaged in decision-making processes (Tilbury, 2019). School leaders can foster ownership by integrating sustainability into strategic plans and providing professional development opportunities for teachers (Center for Green Schools, 2024).

2. **Engaging the School Community:** Sustainability thrives on collaboration. Establishing a Sustainability Action Team that includes students, teachers, staff, and parents creates a sense of shared responsibility. This team can spearhead initiatives, monitor progress, and encourage participation across the school (Davis & Jones, 2024).

3. **Curriculum Integration:** Embedding sustainability into the curriculum enhances its relevance and impact. For instance:

    - In science classes, students can investigate renewable energy technologies.
    - In mathematics, they might analyze school energy consumption data.
    - In art and language lessons, they can explore environmental themes creatively (UNESCO, 2022).

4. **Operational Practices:** Schools can reduce their ecological footprint by implementing green practices such as energy-efficient lighting, waste segregation, and the use of renewable resources. These initiatives provide hands-on learning opportunities for students, demonstrating the tangible benefits of sustainable choices (Harris & Smith, 2024).

5. **Community Collaboration:** Partnerships with local businesses, NGOs, and government bodies can amplify the school's efforts. Community engagement activities, such as clean-up drives or sustainability fairs, build connections and raise awareness beyond the school grounds (Sustainability Directory, 2024).

In summary, these key elements work together to create an integrated approach to sustainability that not only enhances educational outcomes but also fosters a culture of environmental stewardship within the school community.

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4.1.3 Involving the School Community in Goals

Setting objectives is the foundation for achieving long-term, impactful results that benefit the entire school community. Defined objectives channel individual efforts into collective action, fostering a shared vision and establishing a culture of collaboration (Doran, 1981). Tajfel and Turner (1986) emphasize that common goals build solidarity, while UNESCO (2020) highlights the importance of inclusivity in generating creative and applicable solutions.

To involve the whole school community in setting and implementing goals, principals and school leaders can take the following strategic and practical steps:

1. **Organizing Collaborative Workshops and Seminars**

Workshops and seminars are essential platforms for engaging teachers, students, and parents in sustainability goal-setting. These gatherings facilitate idea exchange and collective visioning. Hosting in-service training with sustainability experts can further raise awareness and disseminate scientific insights (Sterling, 2011; UNESCO, 2020).

2. Defining Roles and Responsibilities

Clearly assigning roles to all stakeholders ensures comprehensive engagement in the process of achieving sustainability goals. Teachers, students, parents, and staff contribute according to their unique skills and capacities. Defining responsibilities enhances accountability and motivation while fostering solidarity (Tajfel & Turner, 1986; Sterling, 2011).

3. Leveraging Digital Tools

Digital platforms are indispensable for enhancing collaboration across the school community. Tools such as shared online documents and project management software facilitate hybrid working environments and real-time feedback while ensuring secure data storage. Proper training on these tools ensures their effective use (Dolan, 2021; Sterling, 2011).

4. Establishing Sustainability-Focused Student Clubs

Creating student clubs centred on sustainability themes encourages active participation in relevant social, cultural, and scientific activities. These clubs enable students to develop new skills and represent diverse ideas in school-wide decision-making processes (UNESCO, 2020).

5. Conducting Motivational and Awareness Campaigns

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Inspirational campaigns on environmental issues energize the school community. Activities such as motivational events, project showcases, and awareness days engage students and staff in meaningful discussions and actions, cultivating a sense of responsibility (Gibson, 2017; UNESCO, 2020).

6. Collaborating with Local Communities and Experts

Schools can strengthen their objectives by collaborating with local NGOs, municipal authorities, and environmental experts. These partnerships bring technical expertise and innovative perspectives, making resource use more efficient and solutions more impactful (Anderson & Ostrom, 2008; Chambers, 1994).

7. Establishing a Sustainability Vision

A collaborative process to define a shared vision for sustainability ensures that goals reflect the values and priorities of the entire school community. This vision provides a unifying framework for all initiatives.

8. Conducting Environmental Audits

A thorough audit helps assess current practices, such as energy usage and waste management. This data-driven approach identifies areas for improvement and shapes realistic goals.

9. Developing Action Plans

Using insights from audits, schools can draft action plans with specific timelines, roles, and measurable targets. Regular progress reviews ensure accountability and adaptability.

10. Integrating Sustainability Across Curricula

Embedding sustainability themes into lesson plans equips students with knowledge and skills to address environmental challenges. Providing training and resources for teachers supports this integration.

11. Celebrating Achievements

Recognizing milestones in sustainability initiatives through events and rewards fosters pride and motivates further action. Celebrations also raise awareness among broader audiences, including parents and local stakeholders.

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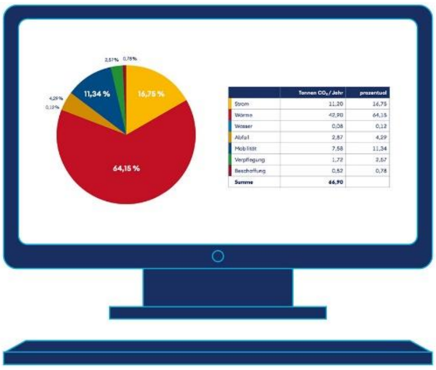
These combined strategies and steps, grounded in research and practical tools, equip schools to engage their entire community in defining and implementing goals for sustainability and environmental action. By building inclusive participation and leveraging available resources effectively, schools can achieve meaningful and lasting impacts.

Case Study:

Using the Greenpeace CO_2 Calculator

A practical and effective way for schools to initiate their journey towards environmental sustainability is by assessing their current carbon footprint. The Greenpeace CO_2 Calculator provides a user-friendly and comprehensive tool for this purpose, enabling schools to evaluate their environmental impact across key domains such as energy usage, mobility, catering, and procurement.



How It Supports the Whole-School Approach

The CO_2 Calculator exemplifies the Whole-School Approach by engaging the entire school community—students, teachers, and staff—in a collaborative effort to assess and reduce emissions. This process aligns perfectly with the core principles of the Whole-School Approach: embedding sustainability into governance, curriculum, operations, and community engagement.

Step-by-Step Integration

1. **Gathering Data as a Community Activity**:
   - Teachers guide students in collecting data on energy use, transportation, and school meal practices.
   - The school community, including custodians and cafeteria staff, contributes operational insights, fostering inclusivity and collaboration.
2. **Analyzing Results to Identify Priorities**:
   - The tool's visual reports make it easy to pinpoint the largest contributors to the school's carbon footprint, providing a clear starting point for action.
   - This step encourages interdisciplinary collaboration, with math classes analyzing data and science classes exploring emission reduction strategies.

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3. **Building a Shared Vision**:
    - The results of the CO_2 assessment provide a foundation for a school-wide sustainability vision.
    - Leadership teams can use this data to engage stakeholders, including parents and local partners, in developing actionable goals.
4. **Kickstarting School-Wide Initiatives**:
    - By identifying key areas for improvement, such as reducing heating emissions or promoting eco-friendly transportation, schools can design targeted sustainability projects.
    - These initiatives can be integrated into daily routines, governance policies, and classroom activities, creating a cohesive Whole-School Approach.

Educational and Cultural Impact

Implementing the CO_2 calculator as a starting point offers significant educational and cultural benefits:

- **Hands-On Learning**: Students connect theoretical concepts to real-world environmental challenges, enhancing their critical thinking and data analysis skills.
- **Empowerment**: Involvement in the process fosters a sense of ownership and self-efficacy, motivating students to take leadership roles in sustainability initiatives.
- **Culture Shift**: The transparency of the results and collaborative efforts create a shared understanding of sustainability challenges, embedding environmental responsibility into the school's ethos.

4.1.4 Step-by-Step Guidelines for Implementation

Implementing environmental sustainability initiatives in schools is a collaborative journey that involves thoughtful planning, decisive action, and ongoing reflection. This section outlines a clear, step-by-step guide for teachers, students, and staff to bring sustainability ideas to life while ensuring each initiative is impactful and achievable.

Step 1: Identify a Focus Area

The first step is to identify a focus area, such as waste management, energy use, or transportation. By conducting environmental audits, gathering community input, and using tools like the Greenpeace CO_2 Calculator, schools can pinpoint specific issues to address. This clarity gives direction to efforts and helps the community unite around a common goal.

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Step 2: Form a Team

Collaboration is crucial for success, so forming a dedicated Sustainability Action Team ensures shared ownership and accountability. This team, made up of students, staff, and parents, can assign roles and responsibilities to streamline efforts. For instance, students may lead outreach, while staff handle logistics and external communications.

Step 3: Set Clear Goals and Objectives

Clear goals are essential for motivation and progress tracking. Schools can develop SMART goals—specific, measurable, achievable, relevant, and time-bound—and align them with broader policies or frameworks. An example might include reducing cafeteria waste by 30% within six months by introducing composting and banning single-use plastics.

Step 4: Create an Action Plan

An action plan serves as the roadmap for implementation. Using templates to organize tasks, prioritize activities, and set timelines ensures structured and efficient progress. For example, an energy conservation project could begin with an audit, followed by simple steps like turning off unused lights.

Step 5: Secure Resources

Securing resources is critical to avoid delays and ensure quality. Schools can inventory existing materials, seek donations from local businesses, and apply for grants. For instance, a hardware store might donate energy-efficient light bulbs to support an initiative.

Step 6: Raise Awareness and Build Engagement

Raising awareness and engaging the community ensures active participation. Launch events, creative outreach like posters or workshops, and integrating the project into classroom activities can build excitement and understanding. For example, students designing waste-sorting posters can encourage proper recycling practices in the cafeteria.

Step 7: Implement the Initiative

With a plan and resources in place, implementation begins. Starting with small, high-impact actions builds momentum, while regular communication keeps the school community informed and engaged. Progress can be monitored to ensure alignment with the action plan.

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Step 8: Monitor Progress and Adjust

Monitoring progress is vital to refine efforts and maintain effectiveness. Schools can use measurable indicators like energy savings or waste reduction and gather feedback through surveys or interviews. Adjustments, such as clearer signage for recycling bins, can be made based on observations.

Step 9: Reflect and Celebrate Achievements

Reflection and celebration are key to recognizing achievements and fostering a culture of learning. Organizing sessions for students and staff to share experiences, documenting results, and hosting events like a Sustainability Day can highlight successes. For example, showcasing before-and-after photos of energy-saving measures can inspire continued efforts.

Step 10: Plan for Long-Term Sustainability

Finally, planning for long-term sustainability ensures the initiative's lasting impact. Embedding practices into school policies, rotating leadership roles, and encouraging new opportunities for action help sustain momentum. A tree-planting project, for instance, could evolve into an ongoing program for maintaining green spaces.

By following these steps, schools can effectively translate sustainability goals into meaningful actions that address environmental challenges while fostering a culture of collaboration and continuous improvement. This process empowers the school community to lead by example and create a more sustainable future.

4.2 Assigning Roles and Responsibilities

A successful environmental initiative depends on the clear definition and assignment of roles and responsibilities. When each member of the school community understands their role and collaborates effectively, projects run smoothly and achieve their goals efficiently. This section explains how to define roles, assign tasks, and foster teamwork, offering practical strategies and tools to support teachers in managing these efforts.

The Importance of Assigning Roles

Assigning roles and responsibilities ensures that:

- Tasks are clearly defined, so everyone understands their contributions to the broader goal.

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- Accountability is established, allowing progress tracking and quick resolution of challenges.
- Collaboration is enhanced by delegating tasks aligned with individual strengths and interests, boosting motivation.
- Workload is balanced, preventing burnout and ensuring no one is overburdened.

By strategically assigning roles, teachers can create a structured and organized approach that empowers all participants to contribute effectively.

4.2.1 Defining and Assigning Roles

Successfully implementing environmental initiatives starts with defining tasks, aligning them with team strengths, and fostering collaboration. These steps ensure that every participant understands their role and contributes effectively to the project.

Step 1: Identify the Tasks

Begin by breaking the project into clear, actionable tasks such as research, organizing events, managing outreach, or monitoring progress. Each task should include details about its purpose, requirements, and expected outcomes. Teachers can use task breakdown templates to organize and clarify these components.

Step 2: Understand the Team's Strengths

Assess the skills, interests, and availability of participants, whether they are students, staff, or external stakeholders. Match tasks to individuals based on their expertise, passions, and capacity. For example, technical tasks like data analysis might go to those with analytical skills, while outreach efforts could be assigned to those passionate about community engagement. Aligning tasks with strengths ensures both quality work and motivated participants.

Step 3: Assign Roles Clearly

Once tasks are defined and team strengths are identified, communicate assignments clearly. Use written role descriptions, visual charts, or responsibility templates like a RACI matrix to show how each person's role connects to the overall project. For example, in a waste reduction project, a student leader might coordinate meetings, teachers could mentor the team, and a parent volunteer might manage outreach to local businesses.

Ensuring Clarity and Understanding

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After assigning roles, ensure participants fully understand their responsibilities. Kickoff meetings can introduce the team, outline objectives, and clarify roles. Written guides, including task lists and timelines, provide a point of reference, while project management tools ensure easy access. Training or mentorship opportunities can build confidence in team members, and regular check-ins allow for feedback, progress tracking, and troubleshooting.

Fostering Teamwork and Collaboration

Assigning roles is only part of the process; effective teamwork ensures the project's success. Establish shared goals to align efforts, emphasizing how each role contributes to the outcome. Open communication through meetings or group chats fosters transparency and problem-solving, while shared decision-making builds buy-in and ownership. Celebrate milestones together to maintain morale, and address conflicts early to preserve harmony and focus.

Clearly defining roles, leveraging individual strengths, and fostering collaboration create a foundation for impactful sustainability initiatives. With these strategies, teachers can guide their communities to work cohesively toward meaningful environmental change.

Case Study: The Eco-Schools Initiative – A Blueprint for Assigning Roles and Responsibilities

The **Eco-Schools Initiative** provides an excellent example of how well-structured roles and responsibilities can lead to successful environmental action. Implemented in Greece by the Hellenic Society for the Protection of Nature (SCPF) since 1995, this international programme encourages schools to adopt sustainable practices and become certified "Eco-Schools." Central to its success is the systematic allocation of roles through the **Environmental Committee**, which ensures participatory decision-making and collective ownership.

A) Roles Within the Environmental Committee

At the heart of the Eco-Schools initiative is the **Environmental Committee**, which brings together representatives from across the school community, including students, teachers, parents, and administrative staff. Its primary responsibilities include:

- **Leading the School's Sustainability Journey**: The committee identifies priority areas for action through an initial environmental audit and develops a tailored action plan.
- **Ensuring Inclusivity in Decision-Making**: Students are given a prominent role in the committee to foster leadership and ensure diverse perspectives.

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- **Coordinating Communication and Engagement**: The committee acts as a bridge between the school, local stakeholders, and the wider community, ensuring all members are informed and involved.

B) Practical Steps for Role Assignment

The Eco-Schools framework provides a clear, replicable process for assigning roles:

1. **Forming the Committee**:
    - The committee is established at the beginning of the programme, with members selected to represent various segments of the school and community.
    - Teachers guide students in taking on leadership roles, empowering them to contribute actively to decision-making and project implementation.
2. **Conducting an Environmental Audit**:
    - Students, guided by teachers, collect data on key areas such as waste management, water usage, and energy consumption.
    - The audit results form the basis for setting goals and planning activities.
3. **Developing and Implementing the Action Plan**:

Roles are allocated based on strengths and interests:

- **Teachers**: Provide expertise, link the initiative to the curriculum, and guide students in research and analysis.
- **Students**: Take the lead on creative projects, such as designing the school's Eco-Code or organizing awareness campaigns.
- **Parents**: Support logistical needs and help connect the school to local businesses and organizations.
- **Administrative Staff:** Assist with operational tasks, such as monitoring energy or waste data.

C) Strategies to Foster Collaboration

The Eco-Schools programme emphasizes collaboration and teamwork through several innovative strategies:

- **Shared Ownership**: The committee ensures that all participants feel equally responsible for the success of the project by involving them in key decisions.
- **Open Communication Channels**: Regular updates are shared with the entire school community through newsletters, assemblies, and displays.
- **Recognition and Celebration**: Milestones are celebrated with events and awards, such as the Green Flag certification, which motivates continued participation.

D) Tools and Templates Used

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To support the assignment of roles and smooth implementation, the Eco-Schools initiative employs practical tools:

- **Environmental Audit Templates**: Standardized checklists guide data collection and analysis.
- **Action Plan Frameworks**: Detailed templates help the committee structure goals, tasks, timelines, and resources.
- **Eco-Code Creation Tools**: Creative formats like posters, raps, or videos engage students and make sustainability principles visible throughout the school.

E) Impact of Structured Roles

The structured role allocation in the Eco-Schools initiative has led to tangible benefits, including:

- Improved environmental practices, such as reduced waste and energy consumption.
- Enhanced student engagement through hands-on leadership opportunities.
- Stronger connections between schools and their local communities, fostering broader environmental awareness.

Key Takeaways for Teachers

The Eco-Schools model demonstrates that assigning roles is more than just delegating tasks—it's about building a culture of collaboration, shared responsibility, and empowerment. Teachers can adapt this approach by:

- Creating their own Environmental Committees to lead initiatives.
- Using tools like audits and action plans to organize roles effectively.
- Encouraging students to take ownership of key tasks, building their skills and confidence.

By integrating similar strategies, schools can lay a solid foundation for sustainability initiatives that not only achieve their goals but also inspire long-lasting environmental stewardship.

4.3 Tools, Methods, and Methodologies

Climate action in schools goes beyond raising awareness—it requires practical tools, effective methodologies, and a collaborative commitment to change. With the right approaches, schools can transition from abstract discussions about sustainability to measurable, impactful actions. The **KlimaRatSchule (KRS)** initiative stands out as a leading example, demonstrating how structured frameworks can empower school communities to tackle climate challenges (Pauli, 2023).

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KRS is a German program that combines data-driven analysis, democratic participation, and actionable planning. By engaging students, teachers, and stakeholders in every step of the process, KRS creates a model where environmental education is not just theoretical but deeply embedded in school operations and culture. Through tools like CO_2 calculators, participatory methods, and comprehensive action roadmaps, KRS enables schools to take ownership of their sustainability journey while fostering critical thinking, collaboration, and leadership skills.

This section explores the details of the KRS initiative, highlighting its innovative tools, methods, and methodologies. By examining its approach, teachers and schools can gain valuable insights into how to design and implement effective environmental projects that inspire meaningful change.

4.3.1 The Climate Council School (KRS) Initiative

The **KlimaRatSchule (KRS)** initiative offers schools a structured and participatory pathway to address climate challenges. Rooted in the principles of democratic engagement and actionable planning, KRS empowers school communities to take ownership of their sustainability efforts while fostering critical thinking and collaboration among students. Designed and implemented in Germany, KRS has proven to be a scalable and adaptable model that seamlessly integrates environmental education with measurable outcomes.

At its core, KRS revolves around three foundational pillars:

1. **CO_2 Balance Analysis**: Schools assess their carbon footprint through detailed, data-driven tools.

2. **Participatory Decision-Making**: A democratic process, often involving a “citizens’ jury,” ensures inclusivity and community-wide support for proposed actions.

3. **Actionable Roadmaps**: Based on collected data and community decisions, schools create a practical plan to implement prioritized climate measures.

These pillars work together to transform schools into climate-conscious communities where environmental sustainability is not only a goal but a shared responsibility.

Students at the Heart of Sustainability

One of the unique strengths of the KlimaRatSchule initiative is its focus on student leadership. By placing students at the centre of the process, KRS fosters their critical thinking, problem-solving, and leadership abilities. Students are not merely participants but active drivers of change. Through

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their involvement in data collection, discussions, and decision-making, they gain hands-on experience in understanding and addressing real-world environmental challenges.

For instance, during the CO_2 balance analysis phase, students collaborate to measure their school's carbon footprint, analyse areas like energy usage and transportation habits, and present their findings to the community. These activities transform abstract climate concepts into tangible experiences, empowering students to take meaningful action.

The Role of Teachers and Facilitators

While students lead the initiative, teachers play a vital role as facilitators. They guide discussions, ensure alignment with educational goals, and provide support throughout the process. Teachers also act as bridges between students and other stakeholders, such as parents, school administrators, and local community members.

Through their involvement, teachers enhance the educational impact of KRS by:

- Integrating sustainability topics into the curriculum.
- Encouraging interdisciplinary learning that connects science, math, and social studies with climate action.
- Supporting students in presenting their findings and proposals to the broader school community.

This collaborative approach ensures that the initiative aligns with both educational priorities and local needs, making it sustainable and impactful.

Why KlimaRatSchule Works

The KRS initiative is more than just an environmental project; it is a holistic framework that transforms how schools approach sustainability. By combining technical tools, participatory methods, and actionable planning, KRS achieves measurable environmental outcomes while fostering a culture of shared responsibility.

The program's methodology ensures that:

- **Sustainability Is Practical**: Tools like CO_2 calculators provide concrete data to guide decisions, making sustainability efforts targeted and impactful.

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- **Democracy Is Practiced**: Participatory decision-making processes engage the entire school community, ensuring that all voices are heard and valued.
- **Learning Is Experiential**: Students and teachers learn by doing, gaining practical skills that extend beyond the classroom.

By embedding democratic values and sustainability into the school's daily operations, KRS not only addresses environmental challenges but also builds civic awareness and engagement among students.

Transforming Schools into Climate-Conscious Communities

Through its three core pillars—CO_2 balance analysis, participatory decision-making, and actionable roadmaps—KRS turns schools into vibrant hubs of climate action. The initiative empowers every member of the school community to contribute to meaningful change, fostering a sense of ownership and shared responsibility. More importantly, it provides a blueprint that is adaptable to diverse educational contexts, making it a valuable model for schools worldwide.

Whether a school is just beginning its sustainability journey or looking to deepen its commitment to climate action, KlimaRatSchule offers a comprehensive and transformative approach. By participating in this program, schools not only reduce their environmental impact but also cultivate the next generation of informed, empowered, and responsible global citizens.

For a detailed KRS Methodology please refer to the chapter 6.3.

4.3.2 Key Tools and Methods in KRS

The success of the KlimaRatSchule (KRS) initiative is built on the thoughtful use of tools and methods that empower schools to take actionable steps toward sustainability. These tools are designed to be practical, user-friendly, and replicable, ensuring that every school, regardless of size or resources, can engage in meaningful climate action. From calculating emissions to fostering inclusive decision-making, these tools form the foundation for an impactful and collaborative process.

4.3.2.1 CO_2 Calculator: Measuring What Matters

One of the cornerstone tools of KRS is the **CO_2 Calculator**, a specialized resource that enables students and staff to measure their school's carbon footprint. By providing precise data on emissions from key areas like energy use, transportation, and procurement, the calculator helps schools identify where their actions can have the greatest impact.

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- **Why It Matters**: Understanding the school's carbon footprint is essential for targeted action. It provides a clear baseline that guides decision-making and ensures efforts are both data-driven and impactful.

- **How It Works**:

  - Students collect data through surveys, utility records, and direct observations.

  - The calculator processes this data to quantify emissions in various categories, such as heating, electricity, transportation, and food.

  - Results are presented visually, making complex data accessible and actionable for all stakeholders.

- **Practical Example**: At a participating school, students used the CO_2 Calculator to analyze emissions from cafeteria operations. They discovered that by sourcing local, plant-based ingredients, they could significantly lower the carbon footprint of school meals. This insight led to the introduction of a "Farm-to-Table Fridays" initiative, which not only reduced emissions but also supported local farmers.

The CO_2 Calculator transforms abstract environmental concepts into tangible figures, empowering students to connect their actions to real-world outcomes.

4.3.2.2 The Energy Walkthrough Protocol

The **Energy Walkthrough Protocol** is a hands-on template that guides schools in auditing their energy use. By systematically evaluating facilities and systems, such as insulation, heating efficiency, and lighting, this tool identifies opportunities for energy conservation and efficiency improvements.

- **Why It Matters**: Energy use is often one of the largest contributors to a school's carbon footprint. Conducting an energy audit provides actionable insights that can lead to both environmental and financial benefits.

- **How It Works**:

  - The protocol outlines a step-by-step process for assessing energy efficiency in key areas, including classroom heating, lighting, and ventilation.

  - Students and staff collaborate to record findings and propose practical solutions.

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    - The data collected serves as a basis for informed decision-making and prioritization of energy-saving measures.

- **Practical Example**: During an energy walkthrough at one school, students identified that many classrooms were using outdated light bulbs. Replacing these with LED alternatives was a simple yet impactful solution, reducing electricity consumption significantly and lowering costs.

This tool not only provides practical recommendations but also engages students in experiential learning, helping them understand energy systems and their impact on sustainability.

4.3.2.3 Participatory Methods: Inclusive Decision-Making

At the heart of KRS lies its commitment to inclusive and democratic participation. The initiative employs a range of **participatory methods** to ensure that all voices within the school community are heard and valued. By fostering collaboration, these methods build consensus and drive commitment to collective goals.

- **Why It Matters**: Climate action is most successful when it reflects the needs and perspectives of the entire community. Participatory methods ensure that decisions are equitable, practical, and widely supported.

- **How It Works**:

    - Participants are selected through random sampling to form representative "micro-juries" or planning cells.

    - Structured discussions guide participants in evaluating and prioritizing proposed climate measures.

    - Techniques like clustering and point allocation are used to refine proposals and build consensus.

- **Practical Example**: In one school, the micro-jury process led to a decision to prioritize behavioral changes, such as encouraging carpooling and reducing heating levels during weekends. These measures were chosen over more expensive infrastructure upgrades, which were deferred to a later phase when funding could be secured.

These methods not only lead to well-rounded decisions but also teach students valuable skills such as negotiation, critical thinking, and collaboration.

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4.3.2.4 Conclusion

The **KlimaRatSchule (KRS)** initiative demonstrates that meaningful climate action in schools is not only possible but transformative. By combining innovative tools, participatory methods, and actionable roadmaps, KRS provides a comprehensive framework for empowering schools to address environmental challenges while fostering collaboration, critical thinking, and civic engagement.

The success of KRS lies in its structured yet adaptable approach. Tools like the **CO_2 Calculator** and the **Energy Walkthrough Protocol** turn abstract sustainability goals into measurable, actionable plans. Participatory processes ensure that every voice in the school community is heard, creating a sense of shared ownership and commitment. The roadmap ties these elements together, offering a clear, strategic path for implementing both immediate actions and long-term goals.

For teachers, KRS is more than a sustainability program—it is an educational journey that integrates real-world problem-solving with interdisciplinary learning. It inspires students to take ownership of their future while equipping them with the skills they need to make a difference.

As schools around the world face growing environmental and social challenges, initiatives like KRS offer a replicable model of hope and action. By engaging entire school communities in data-driven, democratic, and impactful climate initiatives, schools can become catalysts for sustainable change, shaping not only greener campuses but also more informed, empowered global citizens.

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5 Reflecting

5.1 Reflecting and Monitoring Efforts

5.1.1 Understanding Schools as Learning Organizations

The idea of schools as learning organizations promotes an environment where teachers and school leaders continuously enhance their pedagogical and organizational practices, as well as their content knowledge and skills. This improvement occurs through collaborative local research, networking, and ongoing professional development. This way, schools are seen not as isolated entities but as part of a wider network that fosters educational progress (European Commission Report by ET2020 Working Group Schools, 2019, p. 9) This network includes other schools, governance structures, higher education institutions, parents, and the local community, all working together to create a supportive framework for individual school growth. In this chapter we will take this approach to reflect on the monitoring and building capacities of schools engaged in ESD.

To transform a school into a learning organization, it is essential to conduct self-evaluations which will help identify the areas that need improvement (Simons, 2013). This is important because research shows that school evaluations can lead to a range of positive outcomes, including:

- Effects on school improvement: schools can develop and implement a variety of strategies based on the priorities identified through self-evaluation. These strategies can lead to increased professional learning opportunities, curriculum revisions, and targeted support for specific student groups (Nelson, 2015).

- Effects on Institutional practices: approaches such as professional learning communities, lesson study, peer reviews, and data-informed instructions encourage teachers to systematically analyse student achievement data and observe each other's teaching methods (Chapman, 2020). These practices can lead to significant changes in methods and pedagogical content knowledge.

- Effects on student achievement: an effective school self-evaluation often informs school improvement and planning efforts, which can lead to better student outcomes both academically and non-academically.

- Effects on non-academic outcomes: beyond academics, self-evaluation can foster improvements in areas like creating safe and supportive learning environments. A

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comprehensive approach, integrating the classroom, home, school, and even the wider district, supports students' social-emotional well-being and overall success (Elbertson, Brackett, & Weissberg, 2010).

However, evaluating a school's efforts can be challenging for teachers and school leaders (European Commission, 2020, p. 7). To prevent stress or anxiety during this process, self-evaluation should be supported by adequate resources, including dedicated staff and sufficient time allocations.

5.1.2 School Self-Evaluation and Learning for Sustainability

By adopting the learning organization model, schools emphasize ongoing development and adaptability, positioning self-evaluation as a vital tool for assessing their effectiveness. As a result, schools can implement meaningful changes that enhance teaching practices and create sustainable learning environments, ultimately equipping students with the skills necessary to thrive in an environmentally challenged world. The key parts of the self-evaluation to foster sustainability are the following:

- **What?** School self-evaluation is a process by which a school reflects on its practice and identifies areas for improvement. It is primarily about schools taking ownership of their actions and decisions.

- **Who?** A whole-school approach to sustainability encourages the participation of the entire community, including external stakeholders. This ensures that self-evaluation is not limited to school staff and students but benefits from diverse perspectives, enriching the process and supporting a systemic view of the school's impact on learners and the wider environment.

- **Why?** As schools increasingly focus on sustainability, self-evaluation serves as a powerful tool to drive positive change and monitor progress toward sustainability goals.

- **How?** Self-evaluation involves gathering evidence, which may come from both summative and formative assessments, and can be driven internally or externally. It is often a combination of top-down and bottom-up processes.

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5.2 Monitoring and Evaluation Methods

5.2.1 Key Components of Effective Monitoring and Evaluation

Effective monitoring and evaluation are crucial for the successful implementation of sustainability initiatives in schools. By focusing on key components, schools can create a structured approach that not only tracks performance but also fosters continuous improvement and accountability. The following list includes the essential elements for establishing a robust system that supports the overarching goals of sustainability in education.

1. A holistic vision: a comprehensive vision is crucial for guiding sustainability efforts. Starting with the questions: why is the school engaging with sustainability? and what do we wish to achieve through its actions? schools can define their sustainability goals and ensure all stakeholders, including students, parents, and staff, are involved in shaping and updating this vision.

2. An agreed phased plan: having a phased approach helps clarify the stages of transition, which ultimately allows everyone involved to recognize their role and specific tasks to make progress and adjustments as necessary.

3. Defining progress: there are two distinct yet complementary approaches to defining progress. Some schools utilize statements of practice, while others rely on indicators, both of which support the self-evaluation process. Statements of highly effective practice act as benchmarks, allowing schools to assess their current strengths and aim for excellence. Indicators, on the other hand, are flexible tools that can assess progress at various stages—input, output, or outcomes—depending on where the school is in its development journey.

3. An evidence-based approach: it is essential that all monitoring efforts are grounded in evidence. This requires schools to employ diverse methods such as surveys, interviews, focus groups, informal consultations, and observations, to gather both qualitative and quantitative data. This has an impact on stakeholders, as actions or decisions justified by evidence not only enhance accuracy but also boost motivation.

4. Continuous professional development: professional training that enhances capacity building is vital for educators to adopt new pedagogical approaches related to sustainability.

5. Leading by example: school leaders must embody inclusive and sustainable values. Their active involvement motivates staff, students, and parents and promotes a culture of shared responsibility. In fact, a distributed leadership model is considered the most effective approach in this context.

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6. Anticipating potential risks and issues: identifying challenges early such as time constraints, lack of resources, training needs, or poor stakeholder engagement, enables schools to develop strategies to address these issues, ensuring the success of sustainability initiatives. In this sense, conducting a SWOT analysis can help foresee potential risks (see also chapter 2).

7. Seeking policy support: policymakers can provide essential tools and resources adapted to local contexts. They can also facilitate collaboration within and between schools, building bridges with the wider community and even researchers. These actors can offer additional support during the self-evaluation processes.

5.2.2 Indicators of Success

5.2.2.1 Setting Goals and Metrics

To start, the process of setting indicators should be a collaborative effort involving both teachers and students. This collaborative approach is essential because it not only fosters a sense of ownership and engagement but also ensures that the indicators accurately reflect the school's values and sustainability goals in the short and long run. For example, if a school's sustainability goal is to reduce food waste in the canteen, the indicators could focus on both the amount of food waste and the engagement of the school community in addressing the issue. To be more specific, the indicator can be the percentage of reduction in food waste over a specified period (e.g.,each semester or academic year), which is aligned to the goal to reduce food waste by a certain percentage each year, such as 10% over the course of the school year. In the case of qualitative indicators, if we take the same example, an indicator can be the percentage of students participating in food waste reduction initiatives assessed by surveys and tracking the number of students participating in activities to reduce waste.

Setting indicators that are both relevant to the school's context and feasible to measure is crucial. This way, to ensure the effectiveness of the monitoring indicators should reflect the specific needs, challenges, and resources of the school that can go from time, finances, and human capacity to collect and analyse data. For example, while it may be exciting and challenging to measure a large range of sustainability outcomes such as waste reduction or biodiversity preservation, some indicators may be more feasible than others depending on the school's infrastructure and resources.

To conclude, a good suggestion is to choose a mixed approach with both qualitative and quantitative indicators to provide a comprehensive view of progress and outcomes achieved. For example, if the deployment of sustainability actions is showing positive results through quantitative indicators—such as a measurable reduction in food waste in the school canteen—the qualitative indicators

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(surveys, interviews) will help explain the "why" and "how" behind this success. If, on the other hand, the quantitative indicators do not show a decrease in the establishment's waste, then the feedback from the stakeholders involved will easily show the weaknesses of the actions.

Based on the UN Development Program Report on Elevating Meaningful Youth Engagement for Climate Action (March 2022), this list is adapted to the school context to align with the principles of participatory processes, meaningful youth engagement, and climate action:

5.2.2.2 Process Indicators

1. Youth Participation in Decision-Making

- Number of sustainability initiatives in the school co-designed by students and teachers.
- Frequency of consultations with student councils or eco-clubs on ESD action planning.

2. Institutionalization of Youth Engagement

- Presence of policies formalizing student participation in sustainability programs (e.g., roles in decision-making bodies).
- Regularity of dedicated sustainability meetings or workshops involving students.
- Number of events held related to climate action.

3. Inclusivity and Representativeness

- The number of students from diverse backgrounds (gender, socio-economic, and ethnic groups) engaged in ESD programs.
- Number of targeted outreach efforts to ensure inclusion of underrepresented groups in ESD activities.

4. Addressing Structural Inequalities

- Frequency of workshops or activities addressing barriers to participation (e.g., affordability of sustainable program materials).
- The presence of mechanisms to support participation for students with disabilities or other structural challenges.

5. Access to Knowledge and Resources

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- Availability of ESD learning materials (e.g., books, digital resources) for all students.
- Percentage of funding allocated specifically to student-led sustainability initiatives.

6. Promotion of Youth Agency

- The number of leadership opportunities for students in ESD activities.
- Percentage of students who report feeling empowered to contribute to school sustainability efforts in surveys.

7. Gender and Cultural Sensitivity

- Inclusion of culturally and gender-sensitive examples in ESD curricula.

5.2.2.3 Narrative Indicators

8. Alignment with Climate Science and Justice

Frequency of updates to ESD content to reflect the latest scientific findings (e.g., IPCC reports).

- Inclusion of climate justice principles in classroom discussions and activities.

9. Integration with Development Issues

- Number of ESD projects that connect climate action with other Sustainable Development Goals (e.g., health, poverty reduction).
- Frequency of interdisciplinary lessons linking sustainability with broader societal issues.

10. Addressing Systemic Barriers

- Number of student activities addressing socio-political barriers to climate action (e.g., community outreach on sustainable practices).
- Integration of critical thinking exercises in ESD programs that challenge unsustainable systems.
- shifts in their attitudes toward taking personal or collective action on sustainability issues.

11. Promotion of Transformative Solutions

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- Percentage of ESD lessons introducing alternatives to traditional systems (e.g., renewable energy, circular economy).
- Number of school-wide sustainability projects promoting innovative solutions (e.g., school gardens, zero-waste initiatives).

12. Shifting Attitudes Toward Sustainability

- Evaluation of the student’s attitudes toward taking personal or collective action on sustainability issues.
- Increasing awareness on climate issues.

5.2.2.4 Outcome Indicators

12. Secured Inclusion of Youth Inputs

- School sustainability decisions or policies that incorporate formal recommendations from student groups.
- Number of student proposals implemented in school operations (e.g., energy-saving measures).

13. Transparency of Results

- Frequency of public reporting on ESD outcomes to the school community (e.g., newsletters, assemblies).
- Number of platforms where students can track and review progress on sustainability goals.

14. Positive Impacts on Youth Wellbeing and the Environment

- Improved knowledge and confidence in addressing climate issues for students.
- Measurable reductions in school environmental impacts (e.g., lower energy consumption, reduced waste).

15. Intergenerational Equity

- Number of programs that engage both students and their families in sustainability actions.
- Partnerships with local organizations or communities to sustain long-term ESD efforts.

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5.2.3 Methods to Monitor Progress and Outcomes

There are several effective methods for monitoring progress, beginning with the timely definition of progress indicators. Once these are established, the most common and effective ways to measure and monitor include:

- Fix SMART targets.
- Have regular evaluations: conduct evaluations at intervals aligned with the Green School Action Plan—such as every three months, six months, and annually—to track progress, assess effectiveness, and more importantly, to identify areas for improvement. These can take the form of stakeholders' meetings or reports.
- Make use of Data Collection techniques: use reliable methods like surveys, interviews, forms and observations, to gather meaningful and relevant data.
- Have instances of external validation: involving independent parties in the evaluation process, such as "critical friends" (such as school heads and teachers from other schools, local authority representatives, researchers, or other stakeholders), adds credibility and objectivity by providing external perspectives and feedback. Also, another perspective can easily point out blind spots in the internal evaluation.
- Secure feedback mechanisms: ensure that insights from evaluations are integrated and used to adapt and refine action plans, showing a commitment to responsive improvement based on gathered feedback.

To understand how schools can use data to enhance their sustainability efforts, we can refer to the following figure adapted from Schratz et al. (2019)

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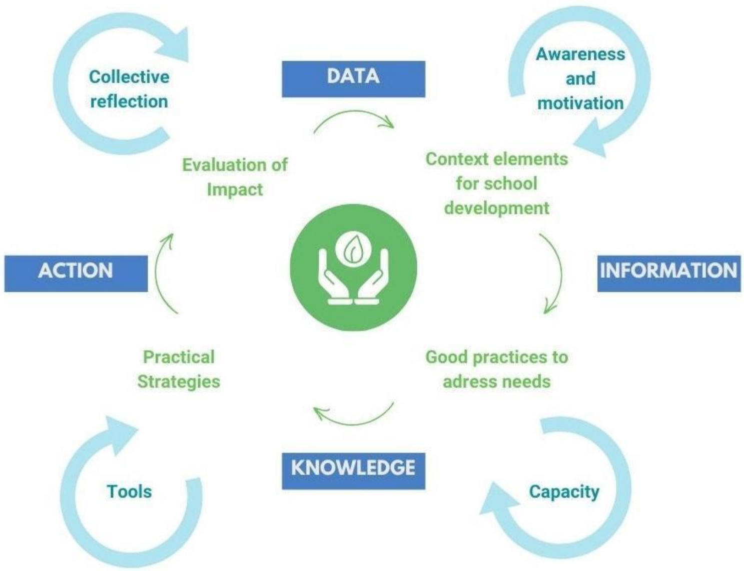

Figure 18 NAME

This transformation of raw data (inputs, processes, outputs, and outcomes) into actionable insights follows a progression: raw data becomes information (contextualized insights relevant to school development), which then evolves into knowledge (identification of effective practices to address needs) and, ultimately, into concrete action (strategies for improvement).

Achieving this progression from data to action is most effective through ongoing dialogue and collective reflection within schools and with external evaluators and stakeholders. Such collaboration fosters a shared understanding of the school's context and its implications for development. This shared understanding enables stakeholders to identify strengths, address challenges, and engage in meaningful school improvement discussions.

What underlines this chart is that awareness and motivation among all key actors, particularly school leaders and teachers, are essential foundations for a productive school self-evaluation process. Only with this foundation will the school and its stakeholders be willing to invest time and effort in developing their evaluation capacities, applying tools, creating strategies for school development, and engaging in reflective discussions on the outcomes of development plans and future priorities.

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5.3 Collecting Data and Feedback

5.3.1 Data Types for Measuring Initiative Success

Qualitative Data	Quantitative Data
• Interviews and focus groups: insights from students, teachers, and staff regarding their experiences and perceptions of sustainability efforts. • Observational data: this includes notes on behaviours and practices observed during school activities that can be done by a tier participant of the initiative. • Case studies: detailed accounts of specific initiatives or projects that illustrate successes and/or challenges.	• Participation rates: the number of students and staff participating in sustainability initiatives (e.g. recycling programs, energy conservation activities). • Behaviour change metrics: tracking of the frequency of sustainable behaviours (e.g., use of reusable materials, reduction in waste). • Survey results: data from pre-and post-implementation surveys measuring attitudes and habits toward sustainability at school. • Resource usage: metrics on energy consumption, water use, and material consumption before and after the initiatives.

Designing effective data collection instruments is crucial for accurately assessing sustainability initiatives in schools. By collaborating, teachers and students can, not only create tools that gather relevant information but also engage the whole school community in the process. The following guidelines outline examples on how to co-design data collection methods, such as surveys, interviews, and observation checklists.

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5.3.1.1 Surveys

- Collaborative development: engage teachers and students in the survey creation process to ensure the questions are relevant and accessible. You can easily use tools like Google Forms to create the template.

- Question types: incorporate a variety of question formats, including multiple-choice, Likert scale (e.g., 1-5 for agreement), and open-ended questions to capture a wide range of perspectives for students and teachers.

- Pilot Testing: Conduct a pilot test of the survey with a small group to identify any issues before distributing it more widely.

5.3.1.2 Interviews

- Structured and semi-structured: Use a combination of structured questions and open-ended prompts to facilitate both targeted and in-depth responses. These questions can be created during an open discussion in the classroom between teachers and students.

- Make a focus group with teachers and students after the activity to gather feedback and to create a sense of community.

- Training for students: provide training for student interviewers on effective questioning techniques and active listening skills to enhance the quality of the interviews.

5.3.1.3 Observation Checklists:

- Create specific, observable criteria related to sustainability practices to ensure consistency (e.g., “students use reusable containers”,.

- Involve students in peer observations to promote engagement and provide varied perspectives on sustainability practices.

5.3.2 Ensuring Data Accuracy and Reliabilities

To ensure that the data collected is accurate and reliable, there are a few effective strategies that can be put to work in the evaluation process.

The first is **triangulation**, this means that they will gather data from several angles. For example, teachers collect survey responses from students about their experiences, administrators conduct interviews with families about any changes they’ve noticed, and classroom observers record students' engagement in real-time activities. By drawing on these diverse sources, the school

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ensures that findings aren't reliant on just one form of feedback or data collection method. This way, every observation, survey, and interview adds depth to better picture the initiative's impact on student learning and institutional sustainability.

The second is the setting up of **standardized procedures for collecting data**. These guidelines establish who will collect each type of data, the specific methods they'll use, and the timing for each collection phase. By adhering to these protocols, the school can reduce inconsistencies in data collection. For instance, if a survey is conducted at a particular point in the semester, it will be done across all classrooms simultaneously which will give a more consistent basis for comparison. Similarly, observers follow the same criteria and checklists when noting student behaviors, ensuring that everyone interprets data points in a consistent, similar way. To go further in this path, schools can invest time in training and calibrating staff and students who will collect the data. The staff members can undergo session(s) on how to use the data collection tools effectively, understand the importance of unbiased reporting, and practice their data-gathering skills. This training serves to ensure that all data collectors, whether teachers, volunteers, or student interns, clearly understand how to administer surveys or conduct interviews without influencing responses. Also, a biannual, staff fora or conferences specifically integrating and encouraging reflection can be impactful.

Lastly but not less important, the school has to do regular reviews of the data collection **process itself**. Ideally once a year, they should take a moment to reflect on how data is being gathered, asking questions like: Are there any signs of bias? Are protocols being followed consistently? Do any tools need adjustments? These periodic check-ins help the school identify issues and refine their approach as needed. For example, the school can do the following : minor reviews conducted annually, major reviews every four years, and long-term analyses every ten years of the ESD strategy.

5.3.3 Gathering and Using Stakeholder Feedback

One fundamental strategy is to create **regular surveys** and **questionnaires** that allow students, teachers, and staff to share their insights <u>anonymously</u>. These surveys are the means to collect their experiences with campus sustainability efforts, from recycling programs to energy-saving measures. By distributing them periodically, the school can track changes in opinion over time and identify emerging trends. This consistent feedback loop not only highlights areas needing improvement but also offers a reliable measure of progress as new initiatives or modifications to already existent activities are introduced.

In addition to surveys, **feedback sessions** such as focus groups can create a space for open dialogue. The advantage of this method is that during these sessions, participants can voice their thoughts

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and concerns directly, which fosters a sense of community involvement and agency. Also, these kinds of sessions provide valuable qualitative insights, capturing the sentiments and ideas that structured surveys might overlook.

To get more spontaneous feedback, **suggestion boxes** are an easy to implement tool. The school can place these boxes in common areas around the campus, to gather the students' and staff thoughts anonymously and at any time.

5.4 Reflecting on Achievements

5.4.1 Systematic Reflection

Teachers and students can systematically reflect by engaging in structured activities that encourage self-assessment, group feedback, and open dialogue about the processes and outcomes of their sustainability initiatives. This can be done through three mechanisms: reflection sessions where each trimester or semester they both take a pause and reflect on the initiatives' progress, either in class discussions or through guided reflection exercises. Another valid way to reflect on the achievements is regularly reviewing the quantitative and qualitative data collected from and after the initiatives to assess whether goals are being met. Lastly, creating a digital portfolio like a blog of project work that includes photos, videos, reports, and reflections on what worked well and what could be improved.

To guide the reflection process there are specific questions that can help collect more and better insight on achievements, challenges, and learning outcomes.

Achievements and successes	**Learning and Growth**
• What were the key accomplishments of our sustainability initiative? • What goals did we meet, and what impact did we observe? • How did our efforts contribute to a more sustainable school environment?	• What new skills or knowledge did we gain through this initiative? • How has this experience changed our understanding of sustainability? • What role did collaboration play in the success of the project?
Challenges and Improvements	**Future Planning**

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• What were the biggest challenges or obstacles we faced? • How did we overcome these challenges, or what would we do differently next time? • What resources or support did we need that we didn't have?	• What should our next steps to build on this success? • How can we ensure that this activity is sustainable on time? • What advice would you give to others starting a similar initiative?

5.5 Reporting and Documenting Outcomes

5.5.1 Structuring a Report

The key elements that should be included in a report of the initiatives are the following. These can be used as a basic structure:

1. Executive summary: a brief overview of the initiatives, objectives, and key findings.

2. Introduction: information on the initiative, including goals and context.

3. Methodology: description of the data collection methods used to evaluate the initiatives (e.g., surveys, interviews, observations) with detailed information about the context of implementation. In this section you should explain how students, teachers, and the community participated in the initiatives.

4. Outcomes and impacts: this part contains a clear presentation of the results, including both qualitative and quantitative data demonstrating the effectiveness of the initiatives. An effective and particularly impactful way to present them is by statistics and infographics. These resources can prove useful when shared with external stakeholders when in search of funding or a wider engagement in community. In the case of interviews, an inspirational way of reflecting is to select pieces of testimonies that hold the statement.

5. Challenges and lessons learned: it is essential to highlight the insights gained from the challenges faced during implementation, along with the strategies employed to overcome and mitigate them. This information is particularly valuable for ensuring the sustainability of activities and when engaging in the wider community because it can serve as guidance to other schools involved in similar initiatives.

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6. Recommendations: this should be an expression of the summon of the activity that can lead to suggestions for future projects based on the findings and lessons learned.

7. Appendices: here there should be included additional data, survey models, charts to analyse them, interview parts, or resources that support the report's findings.

5.5.2 Documenting the outcomes and impacts of the initiatives

In order to effectively document the outcomes and impacts of the initiatives teachers and students can make use of various methods. One effective approach is to maintain regular journals where they can record activities, observations, and reflections throughout the process. It can be digital like a blog or a physical one. Another way of documenting is utilizing data tracking tools, such as spreadsheets or online forms like Google Sheets. These can easily help organize and analyze collected data, including survey responses and participation rates. An essential element of any activity implementation is having visual documentation, such as photos and videos. These complement written records and enhance presentations of outcomes. Finally, a different yet effective way to foster collaboration and document impacts is holding regular reflection sessions between students and teachers to discuss their experiences and gather valuable insights for documentation.

5.5.3 Exploring Formats and Mediums for Reporting

To understand which formats are better for reporting you can check the following table. It is also important to note that you can use one or more ways to report depending on your goal :

Format	What is it ?	What for?
Written Reports	A comprehensive document that includes all the elements of a report suitable for formal review	For internal use in monitoring and tracking activities
Presentations	Slide decks (e.g., PowerPoint or Google Slides) including outcomes and photographs	To summarize findings in a visual and engaging way. This is ideal for meetings or assemblies where the project must be presented.

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Podcasts	Audio recordings where participants discuss the initiatives, outcomes, and personal experiences. They are often available on audio platforms such as Spotify, Apple podcasts or even SoundCloud.	They serve perfectly to make the information accessible and engaging.
Videos	Short videos showcasing the initiatives, interviews with participants, or highlights of events that are hosted on a YouTube Channel or video plaform.	When edited in the right format they can be extremely effective for social media and school websites.
Infographics	Visually appealing graphics that summarize key data and findings in an easy-to-digest format	suitable for display in common areas.
Newsletters or Blogs	Regular updates on initiatives can be shared in school newsletters or on a dedicated blog,	promoting ongoing engagement with the community.

5.5.4 Sharing Outcomes with Community and Stakeholders

It is of major importance to spread the word on the school's sustainable activities if we want to have a greater impact on the broader school community and external stakeholders. In order to do this, there are several strategies that can be implemented. First and in an internal setting, presenting findings during school assemblies can be a powerful way to inform students, staff, and parents about the various initiatives, their outcomes and impacts. These assemblies can also serve as a platform for regular grounding discussions in the ESD team or committee meetings. Another means to communicate, share and eventually advocate could be the use of the school's social media platforms. Essentially, by sharing updates, photos, and videos of the initiatives, the school can keep the community informed and motivate them to join. Hosting community events where students can present their work is another effective approach. These types of events create space for direct interaction between students, parents, and community members, fostering a deeper understanding of the outcomes achieved and also foster the sense of achievement of the stakeholders involved in each activity.

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Moreover, sending out email updates or publishing articles in institutional newsletters can highlight key findings and future plans for sustainability initiatives. This is particularly interesting when the school is a member of a consortia or group of institutions. Alos, establishing partnerships with local organizations or businesses that have an ethical aspect can also be beneficial. This way, collaborating with these entities can help showcase the initiatives and share its outcomes, potentially attracting additional support and resources for future projects.

To conclude, creating visual displays in hallways or common areas can create awareness of sustainability efforts and highlight successes. The idea of making some posters with photos and comments of the people engaged in the action serves as constant reminders of the school's commitment to sustainability while encouraging students to remain engaged about the initiatives in place.

5.6 Celebrating Successes

Besides fostering a supportive environment and reinforcing positive behaviours, celebrating achievements recognizes and validates the progress made and motivates students, teachers and parents to continue with their efforts. Celebrating together also strengthens the community bonds, making sustainability a shared effort and responsibility, rather than an isolated effort, and shows that it's a core part of the school's identity and *ethos*.

The first most common way to start is recognizing and rewarding the efforts of students, classes and teams that contribute significantly to the school's sustainability goals. It is important to highlight good practices and showcase the positive impact of sustainable practices with the school community.

This celebration can be showcased to external stakeholders (e.g. local authorities, CSOs, government agencies, businesses) and by means of multiple platforms**.** Here are some of the most effective and common ways to celebrate successes:

- **Awards:** publicly recognize individuals, classes, or teams that contributed significantly to sustainability efforts through certificates, trophies, or badges.
- **Green events or festivals:** organize eco-friendly events such as "Sustainability Day" where achievements are showcased, and fun, educational activities take place.

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- **Media coverage:** school's can easily highlight achievements in their newsletter, social media channels , or on the school website with stories, photos, and videos that celebrate the contributions of students and staff.

- **Wall of fame or Display boards:** Create a dedicated space within the school where outstanding efforts are visually recognized with posters, photos, charts of environmental impact, etc.

- **Eco-Certifications:** this award is an annual accreditation that recognizes a school's broad sustainability efforts. It also provides a framework and toolkit for taking action and engaging in environmental and nature-based education.

It is important to underline that celebrations are a reflection of our traditions, connecting us to our shared values. By integrating traditional elements into celebrations, we can deepen their significance and create a meaningful experience. Following this idea, here are a few traditions that can be integrated in the curricula to add **richness**, **depth** and **joy** to the school's sustainability efforts.

- **An Annual Sustainability Fair:** the school can establish a yearly event where all sustainability initiatives are showcased, involving workshops, games, and exhibitions.

- **Eco-friendly competitions:** Create the "Green Class of the year" tradition where classes compete in environmental challenges, with a prize for the winning team.

- **Earth Day celebrations:** align school initiatives with global environmental events like Earth Day, Sustainable School's Day or the World Environment Day, using these occasions to celebrate school achievements.

- **Tree planting ceremonies:** you can commemorate milestones with a symbolic event like planting trees in the school or thanks to a partnership with the local municipality. Another idea, can be creating a school garden grow flowers and vegetables.

- **Eco-ambassador programs:** the school can develop a tradition where a few students chosen by their peers are named Eco-ambassadors each year. They will take the leadership in future sustainability efforts.

5.7 Strategies to Reinforce Sustainability

- **Align sustainability efforts with national education and quality assurance frameworks.** This alignment helps create a cohesive strategy that supports long-term sustainability in schools.

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- **Promote collaboration within and between schools, and with the wider community, including researchers** (Hargreaves, 2010).
- **Develop or join school networks focused on sustainability**: Create or participate in networks that promote mutual support and collective growth.
- **Monitor and evaluate the effectiveness of sustainability actions:** regular evaluation ensures that initiatives are making a positive impact and that improvements are identified and implemented.
- **Network with policymakers** to support sustainability efforts to secure long-term commitments and resources.
- **Evaluate and adapt sustainability models over time**: regularly review the effectiveness of sustainability strategies and make necessary adjustments based on data, feedback, and changing circumstances.
- **Secure long-term funding and resources**: it is crucial to ensure continuous financial and material support for sustainability initiatives. Schools can explore multiple funding sources, such as grants and partnerships to sustain their efforts over time.

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6 Good Practice Examples

6.1 Doğa Schools’ NLC and Events

6.1.1 Natural Learning Concept (NLC)

In Doğa Schools' Project Based Education Model, the students work with their teachers on projects that require particular knowledge or skills and plan ideas that has an impact on the real-world problems. Getting students to solve problems on their own through trial and error and project-based learning goes a step further and gets students working on real life dilemmas.

The Natural Learning Concept (NLC) developed by Doğa Schools, which encourages students' interests and creativity and provides a stimulating learning environment where students can explore and come into direct contact with information, has been implemented since 2010. Taking “learning through experience” as the best method to discover and shape their own abilities in a natural environment, NLC is a process that aims to improve the quality of life of society by providing students from primary school level with the right knowledge and tools they need to understand the causes of environmental problems, solve or prevent these problems. Within the Natural Learning Concept (NLC), which is implemented at primary and secondary school level, students are provided with basic process skills such as observation, classification, communication, prediction, assessment, prediction and inference.

Within the scope of the Natural Learning Concept (NLC), students learn about the ecosystem and habitat, life cycles in nature, food groups and balanced nutrition, sustainability and climate issues through practical trainings and workshops, games and colourful visuals in Ecology classes. In the ecological-farming areas and botanical and zoological gardens on the campuses of Doğa Schools, students can grow their own fruits and vegetables, carry out hatching activities, and spend time together with animals in horse riding and pet areas. In addition to these, Doğa Schools regularly brings together students and school communities with many awareness day activities such as ‘A Pot of Happiness’, ‘Tree Planting Festival’, ‘Energy Detectives’, ‘Sustainable Workshops’, ‘Soil Day’, ‘Biodiversity Day’ and many projects such as ‘Ecotherapy’, ‘Healthy Living Festival’.

Within the scope of Project Based Education (PBE), which improves the skills gained by students within the scope of the Natural Learning Concept (NLC) and is implemented at the secondary and high school levels within Doğa Schools, it is aimed for students to gain scientific process skills used in academic and scientific studies such as observing, measuring, classifying, recording data,

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hypothesising, using data and creating models, changing and controlling variables, and performing experiments.

As a part of the Project Based Education (PBE), Doğa Schools contributes to increasing the critical thinking skills of young people on sustainability and environmental issues by actively participating in scientific research project competitions organised by the Scientific and Technological Research Council of Türkiye (TÜBİTAK) and the Turkish Aviation, Space and Technology Festival (TEKNOFEST), especially in the fields of ‘Climate Change’, ‘Polar Research’ and ‘Environment and Energy Technologies’. Besides, in the policy of Doğa Schools, European Union Projects and collaborations have a vital importance in transferring environmental problems and sustainability issues to teachers and students. Through these projects, Doğa Schools support the raising of sensitive and responsible generations who can produce appropriate solutions for the needs of the new age and the effects of climate change.

In line with its corporate vision and the driving mottos of “Happy children learn better” and “Nature is the best teacher”, Doğa Schools regularly provides trainings on climate change, combating the climate crisis and sustainability to its teachers and students at all levels from kindergarten to high school, carries out practical workshops and annually organises thematic conferences.

6.1.2 Sustainability Conventions

Every year, in cooperation with the Departments of Ecology and Psychological Counselling and Guidance, Doğa Schools organises the Sustainability Conventions with the participation of experts and representatives of various public and private sector institutions within the framework of the topics “What is corporate sustainability?”, “What are the environmental, social and economic dimensions of corporate sustainability?” and “What are the corporate sustainability policies of brands?” to ensure that students acquire sustainable consumption behaviours and share and disseminate these behaviours with their peers, neighbours and family elders.

Through the Sustainability Conventions, Doğa Schools aims to help all school community members, especially teachers and students, learn about the problems such as climate change, environmental pollution, energy and water shortages, food shortages, energy and water shortages, which have emerged as a result of natural phenomena such as forest fires, floods, melting of glaciers, deterioration of air quality, which have been increasing in the world in recent years, and to contribute to the positive change of behavioural habits of individuals in their daily lives and to make students aware of sustainability.

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During the Sustainability Conventions, students and teachers develop their perspectives on the concept of sustainability and the work that can be done through sessions with the participation of experts in the field and representatives of various public and private sector institutions, as well as collaborating and producing projects to realise innovative product designs through workshops such as 'Textile Waste Design', 'Bioplastic', 'Epoxy Design', 'Renewable Energy House', 'Paper Waste Recycling', 'Natural Detergent', 'Seed Ball' and 'Pet Bottle Recycling' in groups .

6.1.3 Water Heroes of the Future Events

Doğa Schools organizes Water Heroes of the Future Events with the slogan "Don't underestimate a drop of water!" every year on March 22, World Water Day, to help students and their families better understand the importance of water in our lives and to make individuals aware of the importance of being economical in their daily water usage habits. Within the scope of Water Heroes of the Future Events, Doğa Schools prioritises not only the academic success of students but also the development of their social identities by drawing attention to the increase in the number of countries, including Türkiye, that have been struggling with drought in the world in recent years. Doğa Schools organises many activities and workshops such as water footprint awareness and water harvesting within the framework of the event to raise children as better citizens of the world and with an awareness of saving.

Every year before the Water Heroes of the Future Events, students at Doğa Schools campuses create slogans and visual designs about the importance of water and print them on recyclable t-shirts. The designs from Doğa Schools campuses across Turkey are voted on by students and parents, and then the most successful designs are put up for sale and donated to funds that support smart villages and water well drilling projects in drought-stricken regions such as African countries. In addition, students prepare 'Information Cards' on water use and the importance of water and organise awareness-raising activities by hanging these cards in public areas where they live; school communities in all campuses calculate their water footprints through 'Water Footprint Surveys' and the most successful campuses are awarded at Water Heroes of the Future Events.

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Figure 19 Images from the Doğa Schools Sustainability Conventions

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Figure 20 Images from the Doğa Schools Water Heroes of the Future Events

6.2 The Eco-Schools Programm

While there are various platforms, programs or collaboration models on environmental education and sustainability at the international level, one of the most established, successful, and widespread examples is the Eco-Schools Program.

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Eco-Schools (https://www.ecoschools.global/) is an international program focused on environmental awareness and sustainable development education. It was launched in 1994 by the Foundation for Environmental Education (FEE; https://www.fee.global/) in Denmark, Germany, Greece, and the United Kingdom with the support of the European Commission as a response to the needs identified at the United Nations Conference on Environment and Development in 1992. The program aims to raise awareness of environmental issues in students, to encourage sustainable living habits and to make schools environmentally friendly. Since its launch in 1994, the Eco-Schools program has grown to include more than 59000 schools in 78 countries. Although initially designed to be centred in Europe, the programme has spread globally and has become one of the most comprehensive environmental education projects in the world.

The Eco-Schools Program consists of three structural elements - the Seven Steps Framework, the Eco-Schools Themes, and the Green Flag Assessment. To be successful, the program requires the support of the school management and the school board. The active involvement of staff is essential, as is a long-term commitment and a willingness to involve students in decision-making.

The Eco-Schools program is implemented with a participatory approach and guides schools through a "7 Steps" framework to achieve sustainability goals:

1. Establishment of the Eco-Committee: A team consisting of students, teachers and school staff is established.
2. Environmental Review: The current environmental impacts of the school are assessed.
3. Action Plan: Concrete goals and steps are determined to address environmental issues.
4. Monitoring and Evaluation: How the set goals are progressing is reviewed regularly.
5. Curriculum Connection: Environmental and sustainability education is integrated into the curriculum.
6. Information and Participation: The school community and families are informed, and their participation is ensured.
7. Eco-School Flag: After the program is successfully implemented, the school is honoured with the international "Green Flag" award.

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Figure 21 Eco-Schools' 7 Steps framework to achieve sustainability goals.Source: https://www.ecoschools.global/how-does-it-work

Examples of successful planning processes that teachers / students can learn from

There are several good examples that teachers and students who want to undertake a joint sustainability initiative with the school community and local stakeholders on environmental issues can take as examples in their planning processes for the projects they will carry out together. Some of the prominent examples are as follows:

6.2.1 The Process of the Eco-Schools Programme

The Eco-Schools Programme is an international programme to promote environmental awareness and sustainable development education in schools and to provide environmental awareness, environmental management and sustainable development education in pre-primary, primary and secondary schools. The programme aims to improve the environmental sustainability performance of schools; provide students with spaces that are in harmony with nature, environment and climate; and direct students to solve environmental problems. The Eco-Schools programme aims to create a lifelong positive impact and behavioural change for young people, their families, school staff, and local authorities to improve the environment within the school boundaries and among the local community.

In addition to providing schools with a guiding programme on environmental education, the Eco-Schools Programme is of great importance in this field by awarding the Green Flag, an internationally recognised and respected eco-label symbolising an environmentally sensitive school, to schools that have achieved outstanding success in their work and environmental education within the

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programme (Eco-Schools, 2024). The Eco-Schools Programme recommends the following basic planning steps for the success of environmental initiatives in schools:

- **Step 1 - Creating an Eco-Team:** A team consisting of teachers, students and parents is formed in the school.
- **Step 2 - Environmental Review:** The current situation of the school in terms of energy use, water consumption, waste management, etc. is assessed.
- **Step 3 - Creating an Action Plan:** A plan is prepared with concrete solutions to the environmental problems identified.
- **Step 4 - Implementation and Follow-up of Projects:** School-wide waste collection campaigns, energy saving initiatives or garden greening projects are implemented.
- **Step 5 - Evaluation of Results:** The impact of the projects is reported and shared with the community. In case of success, a Green Flag Award can be obtained.

6.2.2 Zero Waste Project (https://sifiratik.gov.tr)

The Zero Waste Project is an environmental circularity-based waste management project implemented by the Turkish Ministry of Environment, Urbanisation and Climate Change, which supports the efficient use of resources by encouraging public and private sector organisations to adopt sustainable production and consumption habits. The project aims to avoid waste in consumption, reduce and, if possible, prevent waste, and provide added value to the economy by separating and recycling waste at source. In this way, it is aimed to develop social solidarity and achieve positive social changes and results in socio-economic terms (Ministry of Environment, Urbanisation and Forestry, 2024).

The planning stages of the project, which is being implemented in schools in Türkiye to reduce the amount of waste by creating zero waste awareness and raising environmentally conscious individuals, are as follows:

- **Step 1 - Awareness Training:** Teachers and students are informed about waste management and recycling.
- **Step 2 - Separation of Waste Types:** Recycling bins are placed in the school to separate waste types such as paper, plastic, glass, and organic waste.

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- **Step 3 - Establishing a Waste Tracking System:** Students record and analyse the waste collected on a weekly basis.
- **Step 4 - Zero Waste Initiatives:** Solutions are developed to reduce waste. For example, recyclable products can be used instead of plastic in the school canteen.
- **Step 5 - Sharing with the Community:** The results are shared on boards and presentations, and parents are involved to create widespread awareness.

6.2.3 FAO Sustainable Agriculture Project in the School Garden (http://www.fao.org)

The Food and Agriculture Organisation of the United Nations [FAO] (2024) is a special agency of the United Nations that leads international efforts to end global hunger. It aims to ensure food security for all, as well as regular access by people to sufficient high quality food to lead an active and healthy lifestyle.

The organisation, whose main objectives are to reduce biodiversity loss, soil degradation, depletion of water resources, agricultural pollution and greenhouse gas emissions, encourages students in schools to both get to know nature and develop themselves in sustainable life skills by doing agricultural activities in the school garden with the Sustainable Agriculture Project in the School Garden Project. The following steps in the project can be followed in the execution of planning on environmental issues in schools:

- **Step 1 - Project Team and Site Identification:** An area suitable for agriculture in the school garden is selected and tasks are distributed.
- **Step 2 - Education and Awareness Raising:** Under the guidance of teachers, students are taught soil types, planting methods and plant care.
- **Step 3 - Ecological Agriculture Practice:** Vegetables and fruits are planted with natural methods without using chemical fertilisers.
- **Step 4 - Compost Production with Recycling:** Fertiliser needs are met by producing compost from organic waste.
- **Step 5 - Sharing the Results:** Harvested products are shared with the school community and an event is organised.

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These projects and planning steps can guide and help teachers and students who want to put forward initiatives on sustainability in their schools and plan their activities. With well thought out and planned projects, it may be possible to raise environmental awareness and create a sustainable environmental understanding in the school community.

6.3 The KlimaRatSchule (KRS): A Step-by-Step Methodology

The KlimaRatSchule (KRS) methodology empowers schools to tackle climate challenges through a structured, three-phase approach. It ensures measurable outcomes while maximizing engagement by involving students, teachers, and the broader school community.

6.3.1 Phase 1: Data Collection and CO_2 Analysis

The first step in the KRS process involves analysing the school's carbon footprint to establish a baseline for climate action. Key areas include energy consumption, transportation habits, food sourcing, and procurement practices.

Why It Matters: Data-driven actions have the greatest impact. Measuring emissions helps schools focus efforts where they can achieve the most significant results while fostering urgency and clarity among participants.

How It Works:

- Students use tools like CO_2 calculators to measure emissions.
- Data is gathered through surveys, utility records, and observation using templates like the Energy Walkthrough Protocol.
- Findings are visualized in charts or graphs to make the results accessible to the school community.

Example: At one school, students identified transportation and cafeteria menus as major emission sources. They proposed encouraging cycling and offering plant-based meal options, focusing on high-impact areas for improvement.

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Student Empowerment: This phase engages students as environmental stewards, teaching critical thinking, collaboration, and ownership through hands-on learning. Teachers enrich this experience by connecting activities to curriculum areas like math (calculations), science (energy), and geography (transport patterns).

Key Takeaways: Start small by focusing on a few areas, use accessible tools like CO_2 calculators, and involve the entire community in the data collection process.

6.3.2 Phase 2: Democratic Micro-Jury Process

After gathering data, the KRS initiative engages the school community in decision-making through a participatory micro-jury process. This phase ensures climate actions are debated, prioritized, and supported collectively.

Why It Matters: Democratic participation fosters shared ownership, inclusivity, and collaboration. Students learn civic values like negotiation and compromise, while the process builds trust and bridges gaps across the school community.

How It Works:

- A diverse "citizens' jury" of 50 members, including students, teachers, staff, and parents, is formed.
- Members divide into "planning cells" to discuss and refine proposals based on criteria such as environmental impact, cost, and feasibility.
- Structured methods, like voting or point allocation, are used to prioritize measures collaboratively.

Example: At one school, a proposal to limit air travel for class trips sparked debate. The jury compromised by prioritizing train travel within Europe and reserving flights for select opportunities, balancing environmental goals with inclusivity.

Empowerment Through Collaboration: Students present ideas, teachers guide discussions, and parents actively participate, fostering a sense of community.

Key Benefits: Inclusive decision-making, democratic skill-building, consensus-driven outcomes, and stronger commitment to implementation.

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6.3.3 Phase 3: Developing the Roadmap

The final phase transforms collective decisions into a detailed roadmap, turning ideas into actionable steps.

Why It Matters: The roadmap provides structure, accountability, and a shared vision. It bridges planning and action, ensuring momentum and clarity for achieving climate goals.

How It Works:

- Data and decisions from earlier phases are consolidated into thematic categories like energy, waste, and transportation.
- The plan balances short-term actions (e.g., recycling programs) with long-term goals (e.g., solar panel installations).
- Roles are clearly assigned: students monitor progress, teachers integrate sustainability into lessons, and staff manage logistics and funding.

Conclusion of Phase 3: The roadmap unites the school community around a clear, actionable plan, empowering everyone to contribute to a sustainable future through collaboration and shared commitment.

Conclusion

The KRS methodology ensures that schools take impactful, democratic, and well-organized steps toward sustainability. Its structured process engages the entire community, instils lasting values, and delivers measurable environmental results. By adopting this model, schools can inspire meaningful change and nurture environmental stewardship for generations to come.

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7 Conclusions and Outlook

The PATHWAYS Handbook, developed as part of the Erasmus+ project, offers a strategic and practical guide for integrating sustainability into the operations, curriculum, and culture of schools. As the culmination of the project, this chapter reflects on the achievements, challenges, and the path forward for fostering environmental sustainability within educational institutions.

Reflections on Achievements

The PATHWAYS Handbook has successfully addressed the critical need for systemic change in how schools approach sustainability. Key accomplishments include:

- **Comprehensive Resources:** The handbook provides actionable strategies and tools that are adaptable to various school contexts.
- **Empowered Communities:** By engaging students, teachers, administrators, and local stakeholders, the handbook fosters collaboration and shared ownership of sustainability initiatives.
- **Innovative Methodologies:** Introducing the whole-school approach and emphasizing student leadership have been instrumental in creating impactful and lasting change.

Lessons Learned

Throughout the development and implementation of the handbook, several insights have emerged:

- **The Importance of Customization:** Each school's unique circumstances require flexible strategies tailored to their specific needs and challenges.
- **Sustained Engagement:** Ongoing involvement of all stakeholders, including students, parents, and local organizations, is critical to the success of sustainability initiatives.
- **Continuous Improvement:** Monitoring, reflection, and adaptation are essential to maintaining the relevance and effectiveness of environmental efforts.

Outlook for the Future

The PATHWAYS Handbook lays the groundwork for continued progress in embedding sustainability into school practices. Future directions include:

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- **Scaling and Dissemination:** Expanding the reach of the handbook to more schools and educational networks across Europe and beyond.
- **Innovative Technologies:** Leveraging digital tools, gamification, and data-driven approaches to enhance engagement and effectiveness.
- **Policy Integration:** Advocating for the adoption of the handbook's principles within national and regional educational policies to ensure widespread and sustained impact.
- **Building Global Networks:** Encouraging collaboration among schools, NGOs, and policymakers to share best practices and drive collective action.

Call to Action

As we face escalating environmental challenges, the role of education in shaping a sustainable future becomes increasingly vital. The PATHWAYS Handbook is not just a resource but a call to action for schools to lead by example. By fostering innovation, collaboration, and a commitment to sustainability, educational institutions can inspire transformative change within their communities and beyond.

Together, we can ensure that the next generation is equipped not only with knowledge but with the skills and mindset to build a more sustainable and equitable world. The journey does not end here—it begins anew with every school, every student, and every initiative inspired by the PATHWAYS Handbook.

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Annex

TÜBITAK scientific research project report template

The TÜBITAK scientific research project report template enables the preparation of a content according to academic criteria and ensures that the titles and contents given in the table below are presented with scientific methods:

Project Title	Title the project in a single sentence, briefly and succinctly, giving the reader an idea about the project work. The title should reflect the content of the project.
Summary	The Summary chapter should be between 150-250 words. In the summary, the details of the study, comments and sources are not mentioned; the purpose of the project, the method used, the observations made, and the main findings and results obtained are given in a few sentences. In addition, keywords consisting of a maximum of five words reflecting the project topic in general are given under the project summary.
Goals	The Goals chapter should focus directly on the purpose, concrete objectives and R&D content of the project. It should be explained whether the proposed project topic is a problem that needs to be solved or a previously studied problem that needs to be clarified, how it will solve which needs or which problems it will solve.
Introduction	The Introduction chapter is where the data and results gathered from the research on the subjects of the study and the unanswered questions in this chapter are explained with in-text references on the basis of scientific articles (literature review).
Method	In the Method chapter, the research method, data collection tools, experimental and observation setups and data analysis method should be explained.
Project Work-Timeline	The tasks carried out during the development of the project, such as literature review, field work, data collection and analysis, and writing the

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	project report should be specified in a table. It is very important that the project has a work-timeline.
Findings	In this chapter, the data collected in the study and the results of the analysis of the data are given.
Conclusion and Discussion	In this chapter, the findings collected through the project are presented and explained in accordance with the research question or problem.
Recommendations	In this chapter, if there are any recommendations to guide those who will carry out similar studies are stated.
Bibliography	In this section, all references utilised during the project and cited in the project report are listed. References are listed according to APA citation rules and referencing format.
Annexes	If there are very long tables, formulas, detailed experimental data, computer programmes, questionnaires, etc. based on various research findings, which are thought to distract from the subject or consist of very long texts in the project report, they can be given in the Annexes chapter. Legal permissions, correspondence, e-mail samples, if necessary, obtained to conduct the research should also be given in this chapter.

The TÜBITAK Scientific Research Project Report Content

Source: https://tubitak.gov.tr/tr/yarismalar/2204-b-ortaokul-ogrencileri-arastirma-projeleri-yarismasi

Tools or methods that can be used when monitoring and adjusting the plan

Projects carried out in schools on environmental issues, the ability to monitor the activities and team tasks decided at the planning stage of the project allows the project to be carried out effectively and adjustments to be made where necessary to achieve the objectives. Especially in projects related to environmental issues and sustainability, it is useful to use a flexible and precise monitoring system. The tools and methods to be used by the project team for this purpose play a critical role in the achievement and success of the project.

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The use of emerging digital technologies and participatory methods to monitor and evaluate project activities facilitates the adaptation of projects to local and global sustainability goals. Initiatives that effectively use and integrate these tools into their projects have the chance to offer more innovative and effective approaches to solving environmental problems (United Nations Development Programme [UNDP], 2020). The following tools and methods can be used by the members of the initiatives in schools for monitoring and adjusting the project activities:

a. Monitoring and Evaluation (M&E) Systems: Regular monitoring and evaluation of project processes serves to prevent delays or deviations that may occur in the project objectives. These systems, which serve to check whether the activities planned to be carried out within the scope of the project are realised within the time and budget envisaged in the project plan, help to make the necessary adjustments in the project plan when necessary.

Logical Framework Approach (Logframe), one of these tools, enables an organised evaluation of the project by dividing it into its components such as objectives, activities, outputs and indicators. Another tool, SMART Indicators, serves to evaluate the performance of a project within indicators that focus on specific, measurable, achievable, realistic and timely results (UNDP, 2020).

b. Geographic Information Systems (GIS): For the projects that focus on creating solutions to regional environmental problems, Geographic Information Systems (GIS) are an important tool to directly observe the impact of the project in the field and to create a new strategy, if necessary, according to the changes detected. These technologies can be utilised especially in projects carried out on issues such as the use of agricultural land, loss of forest areas and waste management (Batty, 2005).

Open access platforms such as ArcGIS (https://www.arcgis.com/index.html) and QGIS (https://www.qgis.org/) help teachers and students to instantly observe the effectiveness of the projects carried out on the field and how they are in achieving their goals and to access the right data.

c. Participatory Monitoring and Evaluation: Chambers (1994) states that the inclusion of stakeholders such as local people, volunteers and representatives of organisations or groups whose environmental challenges or needs are addressed by the project in the monitoring processes of projects carried out with participatory approaches, by receiving periodic reports and feedbacks, provides comprehensive and realistic feedback and data on how successful the project is in line with its goals and objectives and how effectively the project activities are carried out, and increases the sense of ownership of the projects by local communities.

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In addition, feedback activities such as regular surveys and focus group interviews to be carried out with the stakeholders involved in the project ensure systematic data collection from the target groups of the project and the identification and correction of any missing areas in achieving the objectives.

d. Project Management Software: The use of digital tools by teachers and students carrying out an environmental project to facilitate the follow-up of the project management process and collaboration among team members provides convenience to users in terms of both resource management and control and organisation of project activities.

Project Management Software such as Trello (https://trello.com/) and Asana (https://asana.com/), which are open access tools designed for this purpose and made available to users in many areas such as planning, scheduling, budget and resource management, communication, quality management and documentation, can be used by teachers and students in the management and monitoring processes of projects.

e. Data Visualisation Tools: According to Kraak and Ormeling (2020), data visualisation tools allow decision-making processes in projects to be managed quickly and effectively in terms of instantly displaying and analysing data based on project processes and enabling correct interventions to be made.

Among the most widely used open access data visualisation tools, Power BI (https://app.powerbi.com/), a cloud-based business intelligence and business analytics platform, enables project teams to obtain effective insights by converting users' independent data sources into visuals by processing them consistently.

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Stakeholder engagement tool

Step 1		
Please add the name of each stakeholder group (e.g., board member, students, families, teachers, teaching assistants, etc.) in column A. Then fill out the accompanying prompts in columns B to C for each row.		
A. Description	B. What's fueling enthusiasm for strategic planning or the change effort?	C. What's fueling potential resistance to the plan (and/or change)?
School council members		No resistance
Parent Governor		No resistance
Staff A	Motivated and skilled	No resistance
Staff B	Motivated and skilled	Time restrictions
Staff C	Motivated and skilled	Time restriction
Staff D	Motivated	Time restrictions
Staff E	Motivated and responsible for library purchases	No resistance
Staff F	Invested	No resistance

Step 2
Please place an X in the column (from 1 to 6) that best describes where the stakeholder in column A of step 1 currently sits on the commitment curve. Then place a Y in the column (from 1 to 6) that best describes where you desire them to be on the commitment curve. If there is no different (i.e., if they are already where you need them), you can put the X and Y in the same column.

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1. Status Quo: Stakeholder is unaware of upcoming changes	2. Awareness: Stakeholder is aware of upcoming changes	3. Understanding: Stakeholder understands upcoming changes	4. Acceptance: Stakeholder accepts upcoming changes	5. Buy-In: Stakeholder is bought in to upcoming changes	6. Ownership: Stakeholder takes ownership over upcoming changes
X					XY
	X			Y	
		X	Y		Y
		X			Y
		X			Y
		X			Y
	X				Y
			X	Y	
X					

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Step 3					
Please fill out the prompts in columns below for each of the stakeholders listed in column A of step 1. You may include one or most different communication vehicles for each stakeholder. If you do so, please list the stakeholder name in column A, and each of the vehicles used to communicate with them in a separate row.					
Stakeholder *This is the specific stakeholder (from your list on the previous table) that you are trying to reach/ engage*	Purpose *What is the purpose of engagement? What are you hoping to accomplish?*	*Specific Vehicle* *In this column, bullet out the new/ existing specific vehicles you will plan to use (e.g. standing meeting, all staff e-mail)*	*Frequency* *How often will you use this vehicle to communicate with this stakeholder?*	*Owner* *Who on your team will be responsible for communication with this stakeholder?*	*Notes* *Include any notes on how to maximize engagement with this stakeholder or when to contact vs. not contact*
Students	To solicit student perspective on what it means to be an effective principal in a RCSD school; incorporate their input into the selection of leadership competencies.	- Stakeholder interviews (one on one) - Focus groups	TBD	Self	
Families	To solicit family's perspective on what it means to be an effective principal in a RCSD school; incorporate their input into the selection of leadership competencies.	- Stakeholder interviews (one on one) - Focus groups	TBD	Self	
Teachers	To solicit teacher's perspective on	- Stakeholder interviews (one	TBD	Self	

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	what it means to be an effective principal in a RCSD school; incorporate their input into the selection of leadership competencies. This is important as teachers are the most impactful drivers of student achievement.	on one) - Focus groups -Survey			
Non-teaching staff	To solicit non-instructional staff's perspective on what it means to be an effective principal in a RCSD school; incorporate their input into the selection of leadership competencies. This is important as teachers are the most impactful drivers of student achievement.	- Stakeholder interviews (one on one) - Focus groups	TBD	Self	
Community Organizations	To solicit the community's perspective on what it means to be an effective principal in a RCSD school; incorporate their input into the selection of leadership	- Stakeholder interviews (one on one) - Focus groups	TBD	Self	

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	competencies. This is important as teachers are the most impactful drivers of student achievement.				
Chiefs of schools, district leadership and union leadership	Along with the purpose stated above, engaging with district personnel helps begin norming on what it means to be an effective school leader in RCSD and creates coherence within the district.	-Decision-making protocol *during upcoming Leadership Development Taskforce meeting*	12/22	Self	
Current school leaders	Soliciting input from school leaders is critical. Their experience leading in RCSD gives us insight into the daily experience of principals in RCSD. Quality feedback from the principals can ensure that the competencies selected align with the role.	-Survey during Leader PD	1/19	Self	
Headteacher					

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