



REVIEW ARTICLE

PROJECT-BASED LEARNING FOR SUSTAINABILITY AND ALTRUISM: IMPLEMENTATION GUIDES FOR PRIMARY AND SECONDARY EDUCATORS

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ARTICLE DETAILS

Article History:

Received 20 August 2024
Revised 23 September 2024
Accepted 15 October 2024
Available online 14 November 2024

ABSTRACT

Teachers are increasingly searching for and creating curriculum materials and projects to teach children and youth about sustainability and how to contribute to human and ecological welfare. This paper provides primary and secondary education guides to implement project-based learning for sustainability, altruism, and human rights. Both implementation guides provide steps for school administrators and teachers to involve young people in altruistic action in their community, emphasizing the development of a global moral identity and a life of service. Project topics are suggested for K – 12 education that align with the U.N. Sustainable Development Goals, the promotion of human rights and global citizenship. Numerous resources for lesson planning, professional development, project ideas and more are provided for educators. This pedagogical paper also suggests that education for sustainable development (ESD) should prioritize teaching children and youth about their core human purpose to live a life of service and presents “purpose mapping” as a related lesson planning framework to teach children about the core human purposes to love, to learn, and to serve.

KEYWORDS

Education for Sustainable Development, Sustainable Development Goals, Elementary and Secondary Education, Project-Based Learning, Global Citizenship Education, Altruism and Moral Development

1. INTRODUCTION

The international community advocates for the protection of human rights and the environment, evidenced by the adoption of two transformative international agreements, the 2030 Agenda for Sustainable Development and the Paris Agreement on climate change. Such agreements establish a common global moral framework for action around social, economic and environmental development within which can be perceived the emergence of a global moral identity among diverse peoples, representing worldwide consensus to uphold care for the natural world and the dignity and equality of all people. In this article, we propose that a global moral identity is best fostered in young people using the pedagogy of project-based learning (PBL) aligned with the United Nations Sustainable Development Goals (SDGs).

The SDGs contain 17 goals, 169 tasks and 304 indicators for compliance to inform thinking, policy and accountability from 2015 – 2030. They address the following objectives, all of which can be pursued by students through project-based learning:

- End poverty, reduce inequality, provide decent work for all
- Food security, nutrition, sustainable agriculture
- Health & well-being
- Education (inclusive, equitable)
- Gender equality and empowerment of women and girls
- Sustainable energy

- Resilient infrastructure, sustainable industrialization and innovation
- Inclusive, safe housing and cities
- Sustainable consumption
- Combating climate change, conserving oceans and ecosystems
- Peaceful societies through access to justice and accountable institutions
- Global partnerships to meet these objectives

These goals are universal, agreed to be pursued locally, nationally and internationally, and by all cultural and religious groups. The pursuit of a universal development agenda is possible because of the human capacity for altruistic or creative love, which is the key value upon which peace between all cultural groups can be established and sustained (Sorokin, 1954). The capability of the human spirit to be altruistic is first awakened in young children who naturally express empathy as part of the long process of moral development. Altruism means that a person serves the actual needs of the other, rather than one's own perceptions or decisions about those needs (Vaillant, 2002). Altruism, which is also central to resilience, can be described as the “highest form of social competence” (Benard, 2004). School projects for human and ecological welfare stimulate altruistic development in young people, teaching them to change existing exploitative relationships between individuals, institutions and the natural environment.

Education for sustainable development (ESD) prepares young people to live a “coherent life of service” in which altruism is expressed in one's private, public and employment behavior. The approach to ESD presented

Quick Response Code



Access this article online

Website:
www.educationsustainability.com

DOI:
[10.26480/ess.02.2024.84.91](http://doi.org/10.26480/ess.02.2024.84.91)

in this article balances the twin imperatives for the altruistic development of the individual with the sustainable development of the society (Haslip and Penn, 2020). Children and youth need to participate in projects that serve the environment and others because it is the active experience of helping that strengthens altruistic motivation. Student participation in real-world projects is also a pillar of educational reform efforts (Prensky, 2016).

Treating learners of all ages as active participants in the construction of a peaceful and sustainable community, rather than just as passive recipients of knowledge, is part of a long-standing movement to change education from a “transmissive” paradigm to a transformative one (Sterling, 2001). For example, in 2002, the U.N.-sponsored Ubuntu Declaration on Education created an alliance of global educational organizations and scientific academies calling for “mainstreaming of sustainable development into school curricula at every level of education. By the early 2000’s, educator toolkits to promote sustainable development had emerged and from 2005 – 2014 the U.N. promoted the Decade of Education for Sustainable Development culminating in the UNESCO World Conference on ESD in Japan in 2014 (McKeown et al., 2002; Wals, 2012). In 2017, the Brookings Institution published a toolkit of practices for measuring global citizenship education related to sustainability (Brookings Institution, 2017). Pursuing sustainability goals through student projects creates a curricular framework that integrates cognitive, social-emotional and behavioral goals (Ludvik et al., 2023). This curricular framework creates opportunities for all children to learn how to actively participate in community improvement. Such a curricular framework invites “infinite local adaptation while lowering the barrier between schooling and society” (Haslip and Penn, 2020). As ESD and global citizenship education (GCE) become widely adopted, schools contribute meaningfully to social change.

2. LIFE OF SERVICE AS PURPOSE

Before introducing the SDGs and related concepts to children and youth it’s important to teach them about a core human purpose - to live a life of service. Table 1 provides a lesson plan framework for “purpose mapping” where teachers create visual and exploratory activities for young children to explicitly teach how each part of the self contributes to an altruistic life of service (Haslip and Penn, 2020). Purpose mapping lessons are recommended for all children and youth and start with “concrete body-to-purpose activities, discussions and reflections” (Haslip and Penn, 2020).

Table 1: A Lesson Plan Framework for Purpose Mapping		
Body Part	Purpose	Service Connections
Body	Be healthy	Be alert, strong and clean. By extension, care for the environment which is the “outer” body that our physical body depends upon and is a part of.
Hands	To help	To serve, share and give.
Head	To learn	To plan, reflect, consult and understand. To solve a problem, to resolve a conflict.
Heart	To love	To care for, protect, forgive, empathize, befriend, console, encourage and so on. All character and virtue development can be categorized with the heart.
Whole Self	Service	With the purpose of life being to serve, the purpose of each body part also becomes clear, and service is understood comprehensively as including being healthy, helping, learning and loving.

3. HOW U.N. GLOBAL GOALS ARE INTEGRATED INTO SCHOOL CURRICULA

As wrote in study, the goal of this educational framework is to [...] form in the learner a complete *global moral identity* through study of universal virtues and principles that are codified in human rights instruments and international conventions, as well as study of the agreements themselves, while also beginning to explore their application through the sustainable development agenda (Haslip and Penn, 2020). This is to be accomplished in the context of local academic standards. Connections between virtues and principles and the sustainable development goals must be made explicit to increase moral reasoning and prepare children to be active problem solvers by engaging them in relevant projects.

Table 2 offers actionable curricular examples for each of the themes found in the sustainable development goals. Each idea is meant to inspire teachers to create learning experiences related to an altruistic life of service.

Table 2: U.N. Sustainable Development Goals, Goal Themes and Curricular Examples		
U.N. SDG	Theme	Curricular Examples
1	End all poverty	1. Provide earlier and more sustained introductions to career opportunities and requirements. 2. Investigate the consequences of economic policies and taxation systems. Partner with college students to help facilitate these investigations. 3. Partner with nonprofits so students learn about the consequences of poverty and local anti-poverty initiatives.
2	Nutritious food	1. Change school lunch menus to healthy foods. 2. Include students in the school menu and meal preparation. 3. Student-run fruit and vegetable distribution programme. 4. Teach nutrition, including vitamin and mineral needs.
3	Healthy lives and well-being	1. Students involved in monitoring their own health. 2. Older children work as an assistant to the school nurse to establish a health monitoring program. 3. Rigorous exercise, sport and outdoor activities. 4. Introduce knowledge of body science, strength training, healing and physical therapy. 5. Teach the relationship between physical and mental health.
4	Quality education and lifelong learning	1. Opportunities for technical and project-based learning are regularly available. 2. Curriculum teaches all 17 of the sustainable development goals through projects and investigations. 3. The development of altruism is monitored along with meeting academic standards.
5	Gender equality; empower all women and girls	1. Challenge gender stereotypes. 2. Teach for integrated personality traits (e.g. sensitive men) 3. Introduce practical expressions of gender equality: women’s equal access to land and property ownership, financial services, inheritance, positions of leadership and freedom from sexual or gender harassment. 4. Is the culture of the school gender neutral or reflective of dominant social norms? (e.g. schools that are punishment-oriented and tolerate verbal bullying would be reflective of an overly aggressive culture and therefore not gender balanced)

Table 2 (Cont.): U.N. Sustainable Development Goals, Goal Themes and Curricular Examples

6	Access to clean water and protection of water	1. Science lessons on water purification. 2. Create water purifiers at increasing levels of complexity. 3. Investigate local water cleanliness, sources, treatment, distribution.
7	Clean energy for all	1. Explore wind and solar power generation. 2. Build energy generation systems. 3. Study of the local power grid and its inefficiencies. 4. Introduce energy and clean power policy.
8	Decent work for all and economic growth	1. Classroom jobs. 2. Team member assignments. Understanding team dynamics and responsibilities, as they relate to social and emotional skill development. The ability to create teams, set common vision, goals, objectives and project management skills are all related. 3. Students as active agents in classroom rule & procedure formation as introduction to policy-making and preparation for entrepreneurship.
9	Industry, innovation and infrastructure	1. Introduce younger children to diverse materials, building usages and types and scale of infrastructure. 2. Teach the concept of sustainable / responsible business practices (formation of “benefit corporation”). 3. Regularly review new and emerging technologies and innovations.
10	Reduce inequalities	1. Teach the concepts of equality, justice and human rights. 2. Children investigate inequalities related to disability, race, nationality, religion, income, political preference and social status. 3. Investigate trade agreements and duty-free market access. 4. Investigate financial inequalities between and within countries.
11	Safe habitations and cities	1. Positive classroom climate. 2. Beautify and organize the classroom, school and grounds. 3. Friendship-building project with neighborhood residents.
12	Sustainable consumption	1. Teach sustainable consumption with a focus on reducing material consumption. 2. Classroom reuse and recycling procedures. 3. Share common materials. 4. Analyze product life cycles including supply chains, disassembly and reuse.
13	Climate change	1. Adjust K – 2 weather explorations from the typical “what is the weather today?” to “how is the weather changing?” 2. Topical investigations: desertification, deforestation, land use, clean power innovation, related investment funds, climate policy and international agreements (COP21)
14 & 15	Marine and terrestrial ecosystems (preserve biodiversity)	1. Maintain a fish tank. 2. Maintain a class or school garden. 3. Related investigations: local land use, mapping, local development projects, environmental assessment policies and procedures prior to development, conservation, advocacy for conservation.
16	Peaceful societies sustained by justice and accountable institutions.	1. Introduce methods of active citizenship. 2. Introduce procedures and mechanisms that sustain accountable institutions: appeal, public comment and documentation, press access, financial transparency, recourse to courts, democratic organizations. 3. Introduce rule of law through student-informed classroom rules and procedures; team participation rules, etc. 4. Create student-involved school courts (e.g. conduct committee) to teach wisdom and justice. 5. Teach conflict-resolution / restorative justice. 6. Focus on student relationship building. 7. Teach character strengths (compassion, honesty, etc.)
17	Partnerships for sustainable development	1. Community and civic engagement. 2. Transition to “community-school” model. 3. Students serve as community mentors or ambassadors in related outreach campaigns, in neighborhoods and with local organizations, building partnership skills.

4. PROJECT BASED LEARNING FOR SUSTAINABLE DEVELOPMENT

Project based learning allows educators to create authentic and meaningful opportunities for students to learn about any of the sustainable development goals. According to a study, project-based learning (PBL) is a pedagogical approach to instruction in which students actively construct their own knowledge over a sustained period of time, collaborating with their peers to complete a *public product* that answers a *driving question* or solves a challenging problem (Lev et al., 2020).

The driving question and/or challenging problem is presented to the

students when the project is launched. Driving questions and challenging problems are often inspired by the academic standards, goals like the SDGs, and/or the local community. Whether teachers select a driving question (or create one with students) or identify an authentic challenging problem, the learning aims at presenting a product that answers the question or solves the problem. A *product* is a representation of learning connected to the driving question or challenging problem. For example, students might write the text for a podcast and record it, contribute content for the class website, harvest vegetables from the school garden to turn into salsa to sell, or develop a plan for creating an inclusive playground. In such examples the *public products* are a podcast, a website,

salsa for sale and a playground design plan, respectively. Public products vary in form, function, and presentation but their creation must ultimately align with the learning goals. This approach is different from teaching the content and having the students create a “project” at the end as a learning extension or fun activity (Krajci et al., 2023). Rather, PBL is an instructional approach where students reflect on their work and engage in multiple cycles of critique and revision in support of creating a product that is eventually shared with a public audience.

4.1 Tenants of High-Quality Projects

In addition to creating public products, there are other tenants or principles of high-quality PBL, including authenticity, intellectual challenge, collaboration and reflection (HQPBL Framework). *Authenticity* means students engage in learning that has an impact in the world beyond the classroom, using tools, technologies, and/or processes utilized in the workforce, or directly impacts the students and their concerns and interests (HQPBL Framework). Projects aligned with the U.N. SDGs are naturally authentic because they address real issues facing the world’s citizens. The principle of *intellectual challenge* encourages students to “learn deeply, think critically, and strive for excellence” (HQPBL Framework). The depth and breadth of the SDGs again naturally pushes students to reason critically, honor different perspectives and develop a moral identity that leads to the advancement of society. Using SDGs

When educators leverage the authenticity of the sustainable development goals and create a project unit that is intellectually challenging, students learn to think deeply about content that is meaningful and relevant (De Vivo, 2022). Intellectually challenging projects also allow teachers to utilize another tenet of a high-quality project, *collaboration* (Almazroui, 2023). Success with the sustainable development goals will never be realized without a collective effort. To answer the driving question, students must work together to find answers to their questions, reason through their findings and ideas, and eventually collaborate to create a public product. Although the definition of PBL suggests collaboration happens locally with peers in the classroom, high quality projects also provide opportunities for students to collaborate with peers across the world, community members, experts, and organizations. Project based learning encourages students to draw from their life experiences, recognizing and elevating differences in personal identities and cultural histories” (Krajcik et al., 2023). *Reflection* throughout the learning process encourages students to refine and revise their thinking and products, increasing personal agency and confidence while teaching students how to assess and improve their work quality (HQPBL Framework). When students engage in a high quality PBL unit, they learn skills like collaboration, critical thinking, reflection, perseverance, and self-regulation while constructing their understanding of the content.

4.2 Planning and Implementing a Project in Phases

A successful PBL unit is built upon student interests, local academic standards, and other adopted learning goals, like sustainable development goals. All three (student interests, academic standards, SDGs) can provide inspiration for a project unit. While the educator is considering which cognitive standards (academic / SDGs) to integrate into a project unit, they also need to intentionally determine what social-emotional and behavioral outcomes align with the project (Ludvik et al., 2023). Simultaneously, are also drafting multiple iterations of their driving question and contemplating potential public products (Table 3).

Project planning is not a linear process, giving educators multiple entry points to identify the big ideas before identifying the specific standards that will be incorporated into the unit. For example, if an educator wants his/her students to learn about climate change (SDG 13), they might look for local standards that align to this sustainable development goal. Another approach is to start with the local academic standards and then align these to the sustainable development goals. For example, the Next Generation Science Standards (<https://www.nextgenscience.org>) call for students to learn cross cutting concepts like cause and effect or patterns. Either of these concepts could align with SDG 6 and 7 to “ensure availability and sustainable management of water and sanitation for all” and to “ensure access to affordable, reliable, sustainable and modern energy for all.” When planning the project, teachers often make some initial contacts with individuals and organizations locally and virtually who might be able to support the PBL unit. That way, when it is time to reach out for support, a relationship has already been established.

One approach to implementing PBL involves four phases: 1) starting the project with an entry event and a driving question, 2) pursuing and developing the knowledge and skills necessary to answer the driving question, 3) developing and critiquing products and answers to the driving

question, and 4) having students present to an audience the answers to their driving question and related public products (pblworks.org).

After the academic standards and learning goals have been determined, a challenging problem or driving question developed, and multiple options for public products considered, it is time to launch the unit with the students in a meaningful way (phase 1). The teacher supports the students as they identify their questions and generate ways to find the answers, all in support of creating a public product or answering the challenging question. Questions are recorded on a “need to know list” and reflected on frequently.

In phase 2 & 3, teachers draw on any number of high impact practices that utilize hands-on, minds-on experiences like guest speakers, field work, experiments, and readings. Educators take on the role of a facilitator, guiding and supporting their learners through scaffolded lessons and learning experiences. The public product is created through the learning, not as an add-on “project” after the learning. In phase 4, the students share their learning with an audience beyond the classroom and reflect on the content, reflect on the learning processes, and the final product. The final reflection is different from the reflective practices that happen during the other phases.

Aligning learning goals, focusing on student interests, and identifying potential projects requires educators to see the big picture and envision the details simultaneously. Table 3 offers big picture project ideas developed around the sustainable development goals, leaving educators to fill in the details. Educators can use the driving questions, like “How can we make recess time safe, healthy, and fun for everyone?” and tailor the project to the needs of the school community. The SDGs for this project encourage students to use their voice for change (SDG 1), creating the plans and policies (SDG 5) for the playground that are equitable while also being fun. SDG 3, about health and well-being, is a broad concept that allows multiple entry points like mental health, physical health, and wellness. As the children engage in learning related to these SDGs and their academic content the project focus remains on creating a useful or meaningful public product, such a new recess plan in the previous example.

Table 3: Project Ideas for Sustainable Development in Elementary Education

Grade Band	SDG Goals	Driving Question	Potential Public Products
K-2	1	How can we work together as a community to support the needs of our neighbors?	Fundraising campaign Community Service project Public Service Announcement Presentation pitch to helping organizations
3-5	1,3,5	How can we make recess time safe, healthy, and fun for everyone?	Action plan to share with other classes; identifying new activities and creating videos introducing the rules to other classes; a menu of activities that rotate by the day; recess zones with activity suggestions
3-5	4, 7	Could we power our school with [wind] energy?	Infographics Demonstration presentation Pitch to school board
K-2 3-5	11	How can we use our voices to make a difference in our community?	Planning a rally Art exhibit Social media campaign Poetry writing/reading
3-5	9	How can we design indoor recess activities that do not take up a lot of space?	Design proposal Prototypes Modeling Video demonstrations of rules

4.2.1 Implementation Guide # 1: Projects for Sustainable Development in Elementary Education

Step 1: Create the SDG PBL School Leadership Team

- A. *Membership.* This team should consist of a building administrator, curriculum director, instructional coach, PBL coach, and educators who possess the skill and will to lead the new initiative.
- B. *Knowledge of PBL.* The team needs to understand PBL and learn about the sustainable development goals. This can be accomplished by having team members familiarize themselves with the concept of PBL, become familiar with foundational PBL books, review the elements of high quality PBL (www.hqpb.org), examine sample project units (www.pblworks.org), and consider how early childhood and elementary school teachers are effectively implementing PBL on blogs, such as www.earlychildhoodpbl.com.
- C. *Decision-making.* Since this team will identify the building goals and outcomes, develop a long-term plan, and strategize how to effectively implement the plan, it is important that building educators are included in this work. Educators' daily schedules, planning time, perceived barriers to implementation, and concerns about purchasing materials are just a few topics for the leadership team to discuss.

Step 2: Develop teachers' capability to integrate sustainable development goals into curricula

- A. *Readings.* Curate readings on sustainability and/or education for sustainable development for the entire staff
- B. *Advocates.* Connect school staff with the Global Goals Ambassadors and/or Global Schools Advocates to answer getting-started questions.
- C. *Professional development.* Identify professional development providers (local, national, and/or global) focused on sustainable development goals to train the staff that:
 - a. Introduces the history of the goals and the agreements that led to their development
 - b. Examines the interrelationships between and among the goals.
 - c. Provides opportunities for educators to practice unpacking individual sustainable development goals by age group or grade level and then allows time for educators to align the SDGs with the academic content.
 - d. Builds teachers' confidence for implementing educational opportunities for sustainable development into their classroom (Boeve-de Pauw, J., et al., 2022)
 - e. Encourages teachers to understand the importance of the SDGs for themselves and their students (Ferguson et al., 2021)
- D. *Lesson plans.* Share lesson plans on the SDGs with teachers. For example, the Global Schools Programme provides 60 lesson plans for primary and secondary students.

Step 4: Develop educators' capability to implement project-based learning

- A. *Readings.* Curate articles, blogs, success stories, and/or a book study for the staff on project based learning.
- B. *Professional development.* Employ a professional development provider to train the staff on PBL, specifically facilitating workshops where educators:
 - a. Develop an understanding of PBL as a pedagogical approach rooted in constructivism and learner-centered practices.
 - b. Engage in the project planning process.
 - c. Design a project that combines academic content with sustainable development goals.
 - d. Are encouraged to make connections between their current curriculum expectations and classroom contexts (De Vivo, 2022)

Step 5: Implement PBL for sustainable development

- A. *Planning time.* Provide ample time in the daily schedule for teaching teams to plan for PBL, including time for writing integrated lesson plans, arranging field experiences and contacting guest speakers. Encourage instructional coaches to attend planning sessions for support.
- B. *Reflection.* Establish a culture of reflection. Educators need to examine and reflect on the quality of student work, how learning outcomes are being met and the successes and challenges of the project unit. An instructional coach can help guide reflective conversations and reconnect teachers with resources provided during professional development.
- C. *Classroom observation, PBL experts and follow-up PD.* Provide opportunities for additional support over time.
 - a. Arrange for teacher-to-teacher observation of PBL in the school or at another school.
 - b. Contract with PBL experts for "just in time" support as the project unfolds.
 - c. Intentionally plan follow-up professional development sessions, timed so educators can reflect on the PBL unit they are finishing while having support to design and develop the next unit.

4.3 Sustainable Development Goals in Secondary Education (Age 11 – 18)

Like primary school teachers, secondary teachers should also align their curriculum with the sustainable development goals by incorporating the SDG targets into their units through daily lesson planning practice and by adopting an interdisciplinary approach to project design. The integration of the SDGs into daily lessons will ensure that teachers consistently expose students to global concerns in an authentic and agentive way. Furthermore, by finding ways to work with colleagues to create project-based units across disciplines, teachers will be able to model and foster the values of cooperation and communication that are key to developing global citizens, while also exploring context-appropriate and creative interpretations of the SDGs.

Incorporating the sustainable development goals into unit and daily lesson designs will bring about two additional benefits. The SDGs serve as a repository of global concerns around which students' spirit of activism, agency, and global moral identity may be galvanized. Having an education focused on exploring and solving the issues that concern us all is a constant reminder for students of our shared humanity, and of the need for activism. This will help in the development of the *altruistic mindset* we need to foster. Additionally, having the sustainable development goals at the centre of the teaching-learning experience answers the inevitable 'why' question that upper grade students ponder as they mature (e.g. why do I need to learn about biodiversity?). Integrating SDGs into lessons answers the question of why, increasing motivation to learn, while the utilization of PBL as an implementation framework trains student in conceptualizing, crafting, and implementing the 'how'.

Project-based learning can also be a vehicle for students to identify themselves with the mission of the SDGs, positioning themselves as future stewards of these causes. Teachers should provide opportunities for students to critically explore each of the goals, the accompanying targets and indicators. The concrete and specific nature of the indicators outlined in each goal area can guide students to find their specific service niche within the constructs, marrying their burgeoning passions, interests and skills with specific areas of global service. If students are afforded the opportunity to shape a global moral identity through this process, then formation of an altruistic life of service becomes attainable. Students are then more likely to select college majors and career paths oriented towards global service, social justice and solving the challenges framed by the SDGs.

Teachers and school administrators who have never engaged in PBL for sustainable development can partner with outside organizations for support, such as the Green Schools Alliance (GSA). GSA also provides a connection hub where educators can access resources, training, and online community connections. Table 4 presents ideas for secondary teachers to plan projects around the SDGs. Examples of grade bands, driving questions and public products are provided.

Table 4: Project Ideas for Sustainable Development in Secondary Education

Grade Band	SDGs	Sample Driving Question(s)	Potential Public Products
6-8	13 Climate Action 15 Life on Land	In what ways can we transform our daily practices to conserve and promote the sustainability of natural resources?	Write letters to lobby and meet with local elected officials for policies that support reforestation and green space development at the local level. (15.2) Host a climate symposium where members of the wider community are invited to listen to students' research and findings on environmental concerns and possible mitigation measures. (13.3)
6-8	11 Sustainable Cities and Communities	How can we create a safe and inclusive environment for children in our communities?	Work with community partners to uplift and monitor areas in communities through beautification projects (11.1, 11.7) Host a World Heritage Day showcase where school and community members can share and celebrate important aspects of their multicultural heritage. (11.4)
9-12	10 Reduced Inequalities 16 Peace, Justice, and Strong Institutions	How can we amplify the voices of those affected by injustice in order to reduce inequality and illuminate the need for a greater focus on access to justice for all?	Create an anthology of immigrant stories by interviewing immigrant classmates, teachers, family members, and neighbors who may have immigrated to escape injustice. (16.1) Design a public information campaign by creating brochures and flyers and distributing them to communities in order to mobilize and partner with community members to take action on a social justice issue specific to that particular community (16.3, 16.10) Use technological tools such as Wevideo, or IMovie to tell the stories that have gone untold, by researching local and global conflicts and highlighting the untold stories of tragedy and/or triumph. (16.1)
9-12	2 Zero Hunger 4 Quality Education	How do educational needs differ based on geographical locations, and in what ways can we identify and mobilize resources in order to provide quality education to meet those needs?	Design a mentoring or tutoring programme for younger students (4.2) Create online student book clubs that partner with schools/classes in different locations (Sample book themes: refugee education, education for girls, social justice movements and leaders) (4.1) Start a backpack initiative drive for students in under-resourced areas (2.1)

4.3.1 Implementation Guide #2: Projects for Sustainable Development in Secondary Education

Step 1: Expand Teacher Knowledge of PBL and SDGs

- A. *Unpacking the SDGs.* Teachers interested in this approach should first visit the U.N.'s SDG website to familiarize themselves with the goals and indicators and determine where their personal interests overlap with the goals (e.g. environmental sustainability, gender equality, health and nutrition, etc).
- B. *Professional development.* Online webinars and courses for continuing education are recommended, such as Teaching the Sustainable Development Goals, the World's Largest Lesson course also called Teaching the SDGs. The SDG Academy Library is also a key hub for accessing webinars and resources on teaching with the SDGs.
- C. *Lesson plans.* The book "Integrating Global Issues in the Creative English Language Classroom" provides multi-day lesson ideas.

Additional lesson plans are provided by The World's Largest Lesson, Global Schools Program, and the book "Empowering Global Citizens: A World Course." See the global examples section for a description of the World Course open source curriculum.

Step 2: Connect to the SDG Community

- A. There are many sustainability-related organizations and online groups, representing a thriving community of like-minded teacher practitioners. These groups offer support and strategies, as well as ready-made units and fun challenges that teachers can incorporate into their classes. Two such active teacher-groups are TeachSDGs (<http://www.teachsdgs.org/>) and Design for Change (<https://designforchange.us/>). Both help teachers connect with the SDGs.

Step 3: Engage Students

- A. To encourage the development of altruism in students, teachers

should meaningfully include them in the PBL planning process by inviting them to review the UN SDG website and identify a common cause for action and study. This topic can then be further refined as a unit or become a long-term class goal.

- B. Alternatively, teachers and students can also work on existing projects started by groups such as the Goals Project (<https://www.goalsproject.org/>), that offer opportunities to connect with other classes both locally and globally. In this case, students can still be given a voice during the project by tailoring their public product to their own community context.

Step 4: Curriculum and Lesson Alignment

- A. We recommend backwards-planning, starting with the public product in mind first, illuminating how the skills represented in their standards and curricula can be integrated in the project implementation phase. For example, an Algebra teacher could incorporate portion-size planning in a unit on ratios and proportions as part of a project designing healthy meal plans for student athletes (SDG 2, zero hunger).
- B. Teachers who teach similar grade levels within the same building can form small cross-disciplinary teams to brainstorm innovative strategies to synthesize SDG project-based learning, curricula, and lesson planning.
- C. For teachers who wish to explore the UN SDGs in activities of shorter duration, the website The World's Largest Lesson (<https://worldslargestlesson.globalgoals.org/>) offers inventive lesson resources that are a little less daunting than a robust project.

Step 5: Secure Permits and Permission for Project Implementation

- A. Teachers should prepare to address possible bureaucratic requirements (permission to use resources, letters of support, application forms, permits) prior to project initiation, and seek help navigating these requirements. For instance, if students will create a community green space, teachers will need to first speak with community leaders about obtaining permits.

5. CONCLUSION

This article presents practical guides for implementing education for sustainable development (ESD) in elementary and secondary school. Young people need both a sense of purpose and opportunities to develop their altruistic potential, which projects for sustainability can provide. As young people become committed to the ethical principles contained in international treaties, conventions and widely accepted proclamations for peace and human rights, such as the Universal Declaration of Human Rights, they develop the *global moral identity* needed to sustain commitment to building an integrated, peaceful and sustainable civilization through their future consumer, career and citizenship choices. Global sustainable development cannot be achieved without teaching the ethical principles and virtues sustaining the concept of sustainability such as care for life, peace, human dignity, and human rights. This approach to education must also introduce to children and youth of all ages the core purposes all humans share: to love, to learn and to serve. *Purpose mapping*, as a lesson planning tool, was presented to guide this process. Conceptualizing schools and educational organizations as institutions for sustainable development will guide each generation to pursue a life of service. The 17 U.N. sustainable development goals, with hundreds of related indicators and tasks, provide a flexible and universal framework for involving students in project-based learning that makes a moral and practical difference.

REFERENCES

- Almazroui, K.M., 2023. Project-based learning for 21st-century skills: An overview and case study of moral education in the UAE. *The Social Studies*, 114 (3), Pp. 125-136.
- Benard, B., 2004. *Resiliency: What we have learned*. WestEd.
- Boeve-de Pauw, J., Olsson, D., Berglund, T., and Gericke, N., 2022. Teachers' ESD self-efficacy and practices: A longitudinal study on the impact of teacher professional development. *Environmental Education Research*, 28 (6), Pp. 867-885.
- Brookings Institution, 2017. *Measuring global citizenship education: A collection of practices and tools*. Washington D.C. Retrieved from https://www.brookings.edu/wp-content/uploads/2017/04/global_20170411_measuring-global-citizenship.pdf.
- CafCu Media. 2015. School lunch in Japan – It's not just about eating [Video Ffile]. Retrieved from <https://www.youtube.com/watch?v=hL5mKE4e4uU>
- Cooper, R., and Murphy, E., 2017. *Hacking project-based learning: 10 steps to PBL and inquiry in the classroom*. Times 10 Publications.
- De Vivo, K., 2022. A new research base for rigorous project-based learning. *Phi Delta Kappan*, 103 (5), Pp. 36-41.
- Doyle, H., 2017. A curriculum for changing the world: Preparing students for an interconnected, global society – Starting in Kindergarten. Harvard Graduate School of Education Usable Knowledge. Retrieved from <http://www.gse.harvard.edu/news/uk/17/05/curriculum-changing-world>
- Epstein, A.S., 2009. *Me, you, us: Social-emotional learning in preschool*. HighScope Press.
- Ferguson, T., Roofe, C., and Cook, L.D., 2021. Teachers' perspectives on sustainable development: the implications for education for sustainable development. *Environmental Education Research*, 27 (9), Pp. 1343-1359.
- Godfrey-Phaure, D., 2016. UK's first earth charter school. Earth Charter Initiative. Retrieved from <http://earthcharter.org/news-post/uks-first-earth-charter-school/>
- Harlan, C., 2013. On Japan's school lunch menu: A healthy meal, made from scratch. *The Washington Post*. Retrieved from https://www.washingtonpost.com/world/on-japans-school-lunch-menu-a-healthy-meal-made-from-scratch/2013/01/26/5f31d208-63a2-11e2-85f5-a8a9228e55e7_story.html?utm_term=.cd8eae495cf7
- Haslip, M.J., and Penn, M., 2020. Cultivating human rights and protecting human dignity by nurturing altruism and a life of service: Integrating U.N. Sustainable Development Goals into school curricula. In H. Mahmoudi and M. Penn (Eds.), *Interdisciplinary Perspectives on Human Dignity and Human Rights*. Emerald Publishing Limited.
- High Quality Project Based Learning. 2018. A framework for high quality project based learning. <https://hqpbl.org/wp-content/uploads/2018/03/FrameworkforHQPBL.pdf>
- Krajcik, J., Schneider, B., Miller, E.A., Chen, I.C., Bradford, L., Baker, Q., Bartz, K., Miller, C., Li, T., Codere, S., and Peek-Brown, D., 2023. Assessing the effect of project-based learning on science learning in elementary schools. *American Educational Research Journal*, 60 (1), Pp. 70-102.
- Kwauk, C., and Robinson, J.P., 2016. *Sistema de aprendizaje tutorial: Redefining rural secondary education in Latin America*. Retrieved from the Center for Universal Education at the Brookings Institute Website: <https://www.brookings.edu/wp-content/uploads/2016/07/FINAL-SAT-Case-Study.pdf>
- Larmer, J., Mergendoller, J., and Boss, S., 2015. *Setting the standard for project-based learning*. ASCD.
- Lev, S., Clark, A., and Starkey, E., 2020. *Implementing project-based learning with young children: Overcoming misconceptions and reaching success*. Routledge.
- Ludvik, M.B., Wills-Jackson, C., Eberhart, T.L., Mulholland, S., Bhansali, S., Nolan-Arañez, S., and Henline, J., 2023. Exploring the potential of mindful compassion pedagogies for effective global citizenship education and education for sustainable development. *International Review of Education*, Pp. 1-23.
- McDowell, M., 2017. *Rigorous PBL by design: Three shifts for developing confident and competent learners*. Corwin Press.
- McKeown, R., Hopkins, C.A., Rizi, R., and Chrystalbridge, M., 2002. *Education for sustainable development toolkit*. Knoxville: Energy, Environment and Resources Center, University of Tennessee. Retrieved from <http://www.esdtoolkit.org/>
- Peterson, C., and Seligman, M., 2004. *Character strengths and virtues: A handbook and classification*. New York, NY: Oxford University Press.

Prensky, M., 2016. Education to better their world: Unleashing the power of 21st century kids. New York, NY: Teachers College Press.

Sorokin, P.A., 2015. Ways and power of love: Techniques of moral transformation. Templeton Foundation Press.

Sterling, S., 2001. Sustainable Education: Re-Visioning Learning and Change. Schumacher Briefings. Schumacher UK: CREATE Environment Centre.

United Nations. (n.d.). Sustainable development goals: 17 goals to

transform our world. Retrieved from <http://www.un.org/sustainabledevelopment/sustainable-development-goals/>

Vaillant, G., 2002. Aging well: Surprising guideposts to a happier life from the landmark Harvard study of adult development. Boston: Little, Brown, and Company.

Wals, A.E., 2012. Shaping the education of tomorrow: 2012 full-length report on the UN decade of education for sustainable development. United Nations Economic and Social Council.

