



Fostering Environmental Awareness in Moroccan EFL Classrooms Through Project-Based Learning (PBL)

Kaoutar Agoub

Faculty of Letters and Human Sciences, Mohamed I University, Oujda, Morocco
kaoutar.agoub@gmail.com

Mohammed El Haddouchi¹

Faculty of Letters and Human Sciences, Mohamed I University, Oujda, Morocco
mohammed.elhaddouchi2@ump.ac.ma

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Abstract

In an era of environmental crisis, survival requires tireless efforts to develop ecological awareness, promote sustainable behaviors, and encourage environmental activism among school learners. On this basis, this paper explores the role of green project-based learning (PBL) in fostering ecological awareness among EFL learners at Tiztouin High School, Morocco. It considers green project-based activities, such as recycling and planting, as practical strategies learners can benefit from to link theoretical knowledge acquired during the ecology and environmental unit content incorporated in Ticket to English textbooks with practical experiences in EFL classrooms. To achieve relevant results, this investigation employs a mixed-methods approach, combining quantitative data collected from a questionnaire completed by 40 participants across two classes with qualitative data gathered through focus group discussions and systematic observations. Descriptive statistics revealed that 95% of participating learners reported positive experiences with the green PBL projects, declaring that green PBL activities enhanced their environmental awareness, instilled a strong sense of accountability, and inspired sustainable actions. The findings also indicated transformative results in learners' attitudes towards sustainability, shifting from a poor interest in environmental concerns to adopting sustainable behaviors within their school and community. The qualitative data not only corroborated the quantitative findings but also revealed an emergent finding that learners developed a high level of vocabulary related to the environment, which enabled them to present their projects fluently. Based on these details, this study suggests that integrating green PBL into EFL in Moroccan high school classrooms is a rewarding strategy, as it enhances language skills, empowers environmental awareness, and promotes sustainable behaviors among learners.

1. INTRODUCTION

In light of the increasing environmental issues, empowering individuals with skills and mindsets to address, discuss, and implement potential solutions to minimize the damage

¹ Corresponding Author

inflicted on planet Earth today is an urgent objective that must be targeted worldwide. Addressing and reflecting on environmental issues is not only a scientific task but also a life concern that every knowledge domain, including the humanities, must consider. Similarly, studying human-nature relationships, articulating related ethical dilemmas, and discussing potential environmental tips are not limited to ecocritical or environmental reflections; they are life objectives that likely require eco-pedagogical efforts to promote and instill eco-friendly ethical perspectives and behaviors in public school learners through activities such as recycling and planting workshops.

In this regard, project-based learning is a practical tool to integrate learners into the call for environmental preservation, guide them, and improve their moral and ethical consideration of living and non-living organisms and ecosystems in schools. It is a pedagogic approach that “integrates knowing and doing. Students learn knowledge and elements of the core curriculum but also apply what they know to solve authentic problems and produce results that matter” (Markham, 2011, p. 39). In the same regard, green project-based initiatives combine theoretical with experiential learning, therefore fostering learners’ environmental awareness. At the same time, they develop learners’ personal and interpersonal skills to learn, exchange information, and act for sustainability and ecological preservation, starting in classrooms and covering every other space of interaction.

Building on this understanding, this paper promotes environmental awareness in EFL classrooms using the environment and ecology unit content taught through Ticket to English in Moroccan high schools. It highlights the pivotal role eco-pedagogical efforts can play in fostering environmental awareness among high school learners. It also considers the possibility of empowering learners’ tendency, accountability, and sense of responsibility toward their surroundings—nature, natural entities, and ecosystems—in EFL classrooms. Moreover, it looks forward to influencing learners’ behaviors outside schools by sustaining their willingness to advocate, as active participants, for environmental preservation within their communities. Hypothesizing the possibility of fostering ecological awareness through green project-based activities, this paper thus answers the following questions:

- Do green project-based initiatives, like planting and recycling, foster environmental awareness among learners in EFL classrooms?
- How do green project-based learning initiatives influence environmental awareness among high school students in the EFL classroom?

- Could green project-based learning activities inspire learners to advocate for sustainability and environmental preservation?

2. LITERATURE REVIEW

2.1. Environmental Education (EE)

Recently, research on Environmental Education (EE) has proliferated in response to the increasing demand for global knowledge and action on environmental preservation. UNESCO sees environmental education as “a learning process that increases people's knowledge and awareness about the environment and associated challenges and develops the necessary skills and expertise to address the challenges” (Borah, 2007). This fundamental definition encompasses learning about the environment as an overall aim of EE, with a focus on developing the skills to address the challenges facing the environment. Similarly, the Colorado Alliance for Environmental Education (CAEE) extends the definitions, characterizing EE as an ongoing learning process that cultivates awareness of the environment and its systems while cultivating critical thinking and problem-solving skills that facilitate responsible decision-making. In other words, environmental education aims to empower individuals in their learning process to have an emotional connection, a sense of responsibility for nature, and a commitment to act in the environment's best interests.

The roots of environmental education can be traced back to the 18th and 19th centuries through the contributions of Goethe, Rousseau, Humboldt, Haeckel, Froebel, Dewey, Montessori, and Geddes (as cited in Palmer, 1998). However, the EE gained considerable momentum following the 1972 United Nations Conference on the Human Environment in Stockholm, which resulted in the formal recognition of environmental education as a distinct discipline (UNESCO, 1972), with a declaration that “education in environmental matters for the younger generation as well as adults... giving due consideration for the underprivileged is essential.” (As cited in Plamer, 1998, p. 7) Following that, the Tbilisi Declaration of 1977 outlined the roadmap and guiding principles of environmental education, which remain in use by many educators and practitioners today. Hence, the three main goals of EE, according to the Tbilisi conference, are:

- (a) To foster clear awareness of, and concern about, economic, social, political and ecological interdependence in urban and rural areas.

- (b) To provide every person with opportunities to acquire the knowledge, values, attitudes, commitment, and skills needed to protect and improve the environment.
- (c) To create new patterns of behavior of individuals, groups, and society as a whole, towards the environment.

(UNESCO, 1977).

Given these goals and the outcomes of the 1992 Rio de Janeiro UN Conference that urged governments to “strive to update or prepare strategies aimed at integrating environment and development as a cross-cutting issue into education at all levels within the next three years.” (Agenda 21, Chapter 36, UNCED, 1992), environmental education has become an integral part of formal and non-formal education worldwide.

Morocco was among the first nations to sign and consent to the agreements that were established at the Rio Summit and demonstrated a solid commitment to the international community in addressing the concerns of environmental preservation and sustainable development (as cited in the 2012 report of SD in Morocco). Morocco enacted a legal framework for the National Charter for the Environment and Sustainable Development in 2014 as an attempt to elevate the importance of environmental education nationwide. As it is urged in Article 17 of the 2014 Law Framework 99-12, “The culture of environmental protection and sustainable development must be an integral part of the *savoir-faire* and *savoir-être* provided in curricula and programs.” (2014, p. 6)

Environmental Education (EE), therefore, not only teaches about the environment but also aims at equipping individuals with the skills and attitudes necessary to make decisions based on precise knowledge and to take responsible actions towards a better future. The success of this endeavor is greatly dependent on its incorporation into both everyday life and educational systems.

2.2. Environmental Education in EFL Classrooms:

As previously stated, environmental education has emerged as an essential element of educational systems globally. Indeed, there is a prevalent belief that this type of education is limited to scientific textbooks and classrooms rather than those that are used for English as a Foreign Language (EFL). This perspective is rooted in traditional education, which emphasizes the integration of environmental topics into the realm of scientific streams. Nevertheless, this viewpoint may fail to recognize the substantial potential that EFL textbooks and classrooms

possess to advance environmental literacy. Hence, integrating environmental education into EFL classrooms has attracted the attention of many researchers (see Cates, 1997; El Moussaouy et al., 2014; Ernst & Monroe, 2004; Hauschild et al., 2012; Gürsoy & Saglam, 2011; Jacobs & Goatly, 2000; Laaloua & Tamer, 2022; Mliless & Larouz, 2018; Nkwetisama, 2011).

The discussions on the role of English language teaching have evolved to align with broader educational objectives that focus on social responsibility and global awareness. This is particularly relevant as English increasingly serves as a universal language and a medium of communication for addressing universal challenges. English teachers, thus, have a mission to help learners interact with people from different parts of the world to solve common global issues. In this regard, Cates (1997) argues that “we can’t call our English teaching successful if our students, however fluent, are ignorant of world problems, have no social conscience by using their communication skills for international crime, exploitation, oppression, or environmental destruction.” (Cates, 1997, p. 4). Cates’ critical perspective on English teaching posits that language proficiency should extend beyond the mere acquisition of grammar and vocabulary to cultivating a sense of global citizenship and a desire to take action. Consequently, this view calls for a reconsideration of the objectives and methods of teaching English as a foreign language, especially in units that introduce themes of environment and ecology, where the integration of environmental education may bridge language learning and civic engagement. As Nkwetisama (2011) maintains, ELT materials should aim to cultivate learners’ critical awareness and empower them to actively engage in addressing ecological challenges.

In the Moroccan context, much effort has been made to integrate environmental education into the national curriculum, particularly into high school textbooks (Zerrouqi et al. 2016). This orientation shows an acknowledgment of the growing importance of environmental awareness and sustainability. However, research has shown that the presence of EE in Moroccan curricula and programs remains limited (Laaloua & Tamer, 2022; Mliless & Larouz, 2018; El Moussaouy et al., 2014; Agorram et al., 2009). According to El Moussaouy et al. (2019), the coverage of environmental content in Moroccan textbooks is superficial and lacks depth and interactive components. This aligns with the findings of Larouz and Mliless (2018), which underscore that high school ELT textbooks often prioritize linguistic goals over substantive engagement with environmental themes. They found that the ELT textbooks are full of euphemisms and passive structures with the absence of agency, which impedes students’ environmental awareness. Similarly, Agorram et al. (2009) point out that the environmental issues represented in the textbooks are in a didactic and fact-based manner, which hampers the

development of critical thinking and problem-solving skills among students. In the same vein, Laaloua and Tamer's (2022) examination of the three high school ELT textbooks revealed that although they include units about some environmental issues, they "remain purely informative without any substantial noticeable effort to transcend the cognitive side and delve into education from and for the environment" (Laaloua & Tamer, 2022, p. 11).

In light of these shortcomings, fostering environmental awareness and sustainable behaviors among students in ELT classrooms requires a shift towards constructive and student-centered teaching methods that allow learners to "engage in knowledge construction, adopt positive attitudes towards the environment, and participate in the common good of the nation" (El Moussaouy et al., 2014, p. 3). In this regard, project-based learning may serve as a transformative method, enabling learners to acquire profound knowledge through "learning by doing" and active engagement with real-world challenges. Through this inquiry-based learning method, which encourages teachers to integrate hands-on projects, such as planting and recycling, students can develop not only environmental awareness but also critical thinking, problem-solving skills, and responsibility towards the environment (Thomas, 2000).

2.3. Project-Based Learning Approach

Project-Based Learning (PBL) is a learner-centered pedagogical approach that engages learners in extended inquiry around authentic and real-world problems, resulting in a public product or presentation. The roots of PBL can be traced back to the early 20th century and attributed to the American philosopher and educational reformer John Dewey (1938), who emphasized experiential and reflective learning as essential for meaningful education. Dewey's philosophy of learning by doing laid the groundwork for modern constructivist approaches, which encourage learners to connect theory with practice through hands-on and problem-based experiences (Handrianto, C., & Rahman, M., 2019). Later, William Heard Kilpatrick (1918), a student and collaborator of Dewey, formally conceptualized the "project method," which advocated for purposeful activity and learner autonomy in education. His work marked a turning point in the progressive education movement and provided the conceptual foundation for what would later evolve into PBL (Kokotsaki, D. et al, 2016).

In fact, the theoretical basis of PBL is grounded in constructivist, experiential, and social learning paradigms. From a constructivist viewpoint, knowledge is actively constructed by learners through their interactions with the environment and peers, rather than being passively absorbed from teachers (Dilekli, Y., 2020). Dewey's experiential learning theory

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emphasized authentic and hands-on engagement as the basis for profound understanding, while Vygotsky's (1978) social constructivism and Bandura's (1977) social learning theory point out the value of collaboration, dialogue, and observation in shaping cognitive development. Thus, PBL integrates these principles by engaging students in collaborative, inquiry-driven learning experiences where knowledge construction is social, contextual, and iterative (Eswaran, U., 202). PBL involves a driving question, sustained inquiry, student agency, and produces an authentic and public output. It differs fundamentally from traditional instruction by shifting the teacher's role from knowledge transmitter to facilitator of inquiry and reflection (Amiri, S., 2025). The Buck Institute for Education (BIE), which is a key organization in modern PBL research and practice, identifies the essential elements of high-quality PBL as including a challenging problem or question, authenticity, sustained inquiry, reflection, critique, and the creation of a public product (as cited in Kamil, N. et al., 2023). These features ensure that learning extends beyond mere memorization and encompasses analysis, synthesis, and creative problem-solving in real-life situations.

The value of PBL lies in its ability to enhance both academic performance and 21st-century transferable skills, such as critical thinking, creativity, collaboration, communication, and self-directed learning (Muchson, M., 2023). Research has shown that students who participate in PBL are more motivated, better at solving problems, and have a better understanding of concepts than students who learn in traditional or lecture-based settings (Johnson, C., & Delawsky, S., 2013). Thus, PBL cultivates lifelong learning dispositions and prepares students for dynamic professional environments by providing opportunities for learner autonomy, real-world relevance, and collaborative inquiry (Muchson, M., 2023). Nonetheless, the effective execution of PBL necessitates substantial teacher preparation, curricular coherence, and institutional support. Educators should develop the capacity to design coherent projects, scaffold inquiry, and assess complex and process-oriented learning outcomes (Eswaran, 2024). When implemented effectively, PBL transforms the classroom into a collaborative ecosystem of exploration and reflection that fulfills Dewey's original vision of education as a process of living and not merely a preparation for future living (Dewey, J., 1938).

Besides the limited studies of integrating EE in Moroccan classrooms mentioned in the previous section, recent empirical studies in non-Moroccan contexts have successfully integrated Project-Based Learning (PBL) in EFL contexts with environmental themes, indicating dual benefits for language acquisition and ecological literacy. Suwaed (2022)

documented improved English language skills and environmental content knowledge among Libyan students through PBL-based writing courses, while Masitoh et al (2025) demonstrated increased climate literacy among Indonesian secondary students using a project-based approach with trade books. Similarly, Ferkache (2024) designed a course syllabus for teaching English for Environmental Education that explicitly links language teaching to environmental citizenship. The qualitative study reported enhanced ethical perspectives and eco-friendly behavior among students, suggesting that well-designed PBL curricula can foster both linguistic and environmental competencies. Kazazoglu (2025) further explored environmental education through eco-literacy, advocating for the integration of sustainability into English Language Teaching (ELT). This work supports the embedding of ecological themes through PBL approaches, emphasizing the pedagogical coherence between language learning and environmental awareness. These studies collectively support the pedagogical synergy between PBL, EFL teaching, and environmental education, indicating that authentic environmental challenges provide meaningful contexts for language learning while fostering ecological awareness.

Therefore, the convergence of Project-Based Learning (PBL) and Environmental Education (EE) in the Moroccan EFL classroom can present a compelling pedagogical synergy. It may propose a transformative methodology, which promotes the engagement of Moroccan EFL learners with critical environmental issues. This study investigates how PBL empowers learners to transcend passive knowledge acquisition and actively engage in problem-solving by framing complex environmental challenges as authentic problems for sustained inquiry.

3. METHODOLOGY

3.1. Research Design

This investigation employs a mixed-methods approach, using multiple sources to enhance the validity and credibility of the findings. It collects quantitative data from a structured questionnaire designed for full-time learners in the first baccalaureate school level at Tiztotin High School in Morocco, targeting the importance of environmental awareness and activism through green project-based learning initiatives, particularly recycling and planting. It also compiles qualitative data, which presents the information shared by the same learners participating in focus-group discussions, elaborating deliberately on their attitudes towards green project-based learning in EFL classrooms. Moreover, it relies on objective daily observation as a valuable assessment strategy, providing insights into learners' attitudes toward

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learning about sustainability in EFL classrooms through tutoring significant eco-friendly projects, ultimately recycling and planting, which were designed and created by these learners as part of Unit 4's environment and ecology curricular theme. On this basis, this study employs project-based learning (PBL) as an integrative, informative, practical, and transformative method to foster environmental awareness and develop a grounded sense of activism among future lifelong learners in Moroccan EFL classrooms.

This study builds on previous research contributions of prominent figures in environmental education, such as Cates. It also considers the arguments of eminent philosophers, including Dewey's and Vygotsky's ideas on the importance of the "action method," which promotes experiential learning strategies, primarily project-based learning initiatives.

Hence, these procedures were implemented concurrently during the first semester of the academic year of 2023/2024. The teacher explained the main objective behind the tutoring of green project-based works, planting and recycling, and the importance of experiential learning in fostering environmental awareness and promoting ecological preservation in the Moroccan context. Learners received support throughout an entire semester, structured into three phases: preparation, implementation, and presentation.

In the preparation phase, learners chose their groups, selected their projects, planned, devised roles, and searched for necessary information about recycling and planting techniques, thereby accumulating adequate English vocabulary for their project guidelines. In the implementation phase, they worked on their projects at home and in school, documented their progress, and periodically reported to the teacher in class. Finally, in the presentation phase, learners showcased their projects to peers, instructors, and community members, sharing their research findings and outcomes. With the teacher as an observer, facilitator, monitor, and field note documentor, this approach not only enhanced their practical skills but also deepened their understanding of environmental issues and the importance of sustainability.

Daily observations and focus-group discussions paved the way for the last activity, which involved distributing questionnaires at the end of the procedure to ensure authentic answers regarding learners' green project-based recycling and planting works. The procedures' results are integrated at the interpretation stage to triangulate findings and strengthen the study's credibility.

3.2. Participants

This study involved two intact first-year baccalaureate classes, one from a scientific stream and the other from a humanities stream, both tutored by the same EFL teacher, with a total of forty learners: twenty-six females (65%) and fourteen males (35%). Most participants (62%) are between seventeen and twenty years old, while the remaining (37.5%) are between fourteen and sixteen years old. Approximately 60% of science-stream learners worked on recycling projects, while 40% of humanities-stream learners engaged in planting projects. The study was conducted in intact classes, with the agreement of both the school's administration and the teacher. Learners' participation in this study was voluntary, legal, and free of charge.

4. DATA COLLECTION AND ANALYSIS PROCEDURES

4.1. Instruments

Systematic Observation

Systemic observation concentrates on learners' feedback on the idea of embracing project-based learning about sustainability, either through the planting or the recycling project. It also considers their interests in working on their green projects from the beginning of the semester until the performance day. In this regard, learners' engagement in the process of preparing and accomplishing their green project works is assessed and recorded through field notes—their answers to the teacher's checking questions about the progress they have made, the interest they have grown, and the challenges they have faced whilst preparing their works, if any, every two weeks before the due date. Consistent checking encouraged learners to interact and engage in green project-based learning.

As an observer, the teacher documented learners' progress throughout the semester: learners' initial reactions to green PBL, their involvement in planning and implementing activities. The teacher also received the groups' reports every two weeks to check learners' progress, assist them, and learn from their reactions.

Focus-Group Discussions

Focus-group discussions target eight groups of five who, after introducing their green projects in a general way, kindly and comfortably discuss and reflect on the following open-ended questions:

1. Could you describe your experience with this semester's green project work?
2. How do green project-based learning initiatives, like these, influence your environmental awareness?
3. How do they promote sustainable action among learners with each other and with their communities?

Two classes, comprising forty participants, contributed to the focus-group discussions: the first humanities class with sixteen learners, the second scientific stream class with twenty-eight learners. The number of learners provided a capacity of eight focus groups, consisting of five members: three humanities groups and six scientific groups. Due to schooling restrictions, we devoted fifteen minutes to focus-group discussions for each group, which lasted two hours in a comfortable and anxiety-free environment inside one of the English subject classrooms at Tiztotin High School. Setting the stage for a rigorous focus-group discussion helped learners concentrate on and consider the importance of discussing project-based learning in fostering environmental awareness and activism. Discussions were moderated and recorded with learners' permission and later summarized and interpreted selectively for thematic analysis.

Questionnaire

This paper develops a nineteen-item questionnaire to investigate learners' perceptions towards green PBL and its impact on their environmental awareness and interaction. This instrument comprised:

- A basic demographic item is used to gather information on age, gender, and stream data.
- Closed-ended questions, consisting of multiple-choice and Likert-type items on learners' prior experience with environmental projects, growing sense of interest, fostering ecological awareness, and triggering environmental preservation.
- Three open-ended items allow learners to elaborate on their PBL experiences, how the project influenced their relationship with the environment, and whether they intend to adopt sustainable actions in their lifestyles.

Written in accessible English, this questionnaire was administered in class after the final phase of the green PBL procedure. It was collected accordingly by the end of the session.

5. DATA ANALYSIS

For the quantitative phase, questionnaire responses were entered into a spreadsheet and analyzed using descriptive statistics (frequencies and percentages). Particular attention was given to items indicating prior exposure to environmental projects, enjoyment of green PBL, perceived development of environmental awareness, and willingness to adopt or maintain sustainable behaviors (e.g., recycling, planting at home). Charts were generated to visualize key patterns (e.g., proportion of students with previous project experience, percentage reporting a "green relationship" with the environment).

For the qualitative phase, focus-group summaries and observational field notes were subjected to a thematic analysis. An initial coding cycle identified recurrent ideas (e.g., initial hesitation, growing responsibility, enjoyment of group work, and emerging activism). These codes were then grouped into broader themes such as (a) cultivating interest in green PBL, (b) developing responsibility and agency through planting and recycling, and (c) extending environmental commitment beyond the classroom. Extracts that illustrated each theme were selected to support the quantitative findings.

Finally, quantitative and qualitative results were integrated in the discussion: survey percentages were interpreted in light of learners' narratives and observed behaviors, allowing a more in-depth understanding of how and why green PBL influenced students' environmental awareness and actions.

6. RESULTS AND DISCUSSION

6.1.Cultivating interest in Green PBL initiatives

The mixed-methods approach, as a research methodology choice in this respect, has provided significant data on how 1st baccalaureate learners in Tiztotin High School perceive sustainable action, develop environmental awareness, and reflect on the importance of green project-based learning in shaping and stimulating responsible and sustainable behaviors among their classmates in the school, and by the same token, among the members of their communities as an emergent finding of this investigation. To proceed, it is essential to note that the targeted learners have already benefited from Unit Four's courses, which concentrate on the environment and ecology themes of study. On this basis, the projects learners worked on at the end of the unit represent the gist of their thematic learning experience. Such a background equips them with the necessary English vocabulary to reflect on their ecological input through experiential learning. It encourages them to develop critical thinking and problem-solving skills, such as autonomy, creativity, and flexibility in the domain of environmental studies.

Indeed, through daily observation, it was noted that most learners developed a gradual, rigorous interest in green project-based learning, even if they initially demonstrated a swift sense of hesitation and an instant reaction of surprise. When asked about the reason for this hesitation and exclamation, they claimed that green project-based learning is unfamiliar. They even complained, saying: "We understand your instructions, but we do not have the slightest idea how to start." Chart 1 confirms this confusion learners expressed in this regard; it indicates that 70% of learners have never worked on any similar project before this year with any other

teachers in the high school. However, the remaining 30% of learners worked on projects like these with science teachers. The result supports previous research suggesting that despite the exerted efforts in this context, the presence of EE in Moroccan curricula and programs often remains limited or superficial (Laaloua & Tamer, 2022; Mliless & Larouz, 2018; El Moussaouy et al., 2014; Agorram et al., 2009), which explains learners' sense of unfamiliarity with green project-based initiatives in Moroccan EFL classrooms.

Have you ever done this kind of project before this year in school?

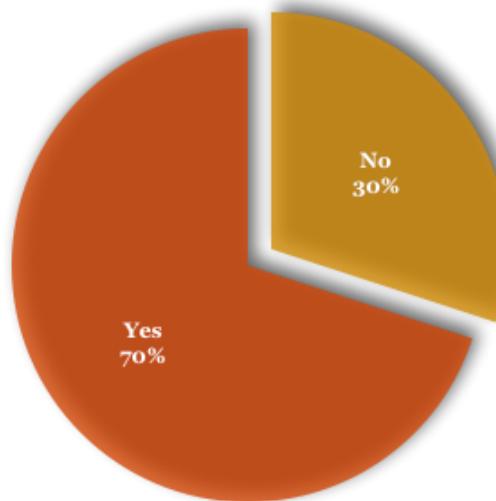


Chart 1. Learners' Prior Green Project Experience in School

Nonetheless, after lengthy negotiations and consistent encouragement, they seemed convinced and confirmed our prediction with the positive feedback they gradually demonstrated during project progress checks. They even exchanged information and ideas, creating an exciting atmosphere of competition and collaboration. During these periods of progress checking, we hear them saying, "Come and check the height my plant reached by now," "I can help you with useful information about your plant choice," or "My recycling project is a lot of work, but it's impressive, I tell you", "I will impress you with a better project; wait to see!" The initial hesitation, followed by increased engagement, reflects the shift from traditional instruction, where students might expect passive reception of knowledge, to active, inquiry-driven learning characteristic of PBL (Amiri, 2025). Changing the nature of instruction to match a more active learning praxis, primarily through green project-based activities, requires passion and compassion. Otherwise, project-based learning, through recycling and planting initiatives, provided engaging and authentic experiences for learners in their English subject classroom, wherein they enjoyed working on their project works, and loved discussing their progress with their classmates throughout the phase of project preparation. Moreover,

some learners offered help to their peers, demonstrating emergent findings of collaborative tendencies and integrative interpersonal skills, including active listening, building relationships, and teamwork. This observed enthusiasm and development of learning capacities regarding teamwork reflect the benefits of project-based learning, which emphasizes authentic engagement and social learning in EFL classrooms (Dilekli, 2020; Vygotsky, 1978; Bandura, 1977; Muchson, 2023). Through actively engaging with the multiple phases of the Green project-based learning activities, learners not only developed language skills, but they also developed life skills, simultaneously fostering authentic and social engagements with peers and groups.

Starting the focus-group discussions with the humanities major learners, the first group described their green-project-based experience as inspiring and overwhelming; they said they had learned how to be patient and responsible for the welfare of their plants. They claimed that green-project-based initiatives, like planting activities, promote environmental awareness among learners. They effectively encourage sustainable action and lifestyle. The second group confessed that their green project-based experience initially seemed wearying and troubling. Searching for an appropriate plant, reading about its planting conditions, and taking care of it were actions they avoided. However, these feelings and ideas eventually disappeared once they started the procedure, chose their plants, and grew them. In addition, they expressed joy in observing their plants grow bigger and stronger daily. This group testified that green-project-based learning fosters environmental awareness about different entities and ecosystems, including plants and habitats. It importantly motivates individuals to search for environmentally related information. It accordingly guides them to develop sustainable behaviors and attitudes toward ecosystems. The last group shared most of the former learners' ideas, concerning the green-project-based learning through the planting initiative. They similarly criticized this learning approach at the beginning of the procedure, but they eventually grasped its importance in fostering environmental awareness. With this in mind, they confirmed our research hypothesis, reassuring green project-based learning's practicality in linking environmental awareness to sustainable action by influencing their life perception as targeted learners and directing their relationships with their communities as potential future ecological advocates equipped with critical thinking and problem-solving skills and endowed with qualities of responsibility, accountability, and agency. Learning by practicing proved beneficial and practical for them; it helped them engage and commit to the learning process. Beyond that, it strengthened their teamwork and interpersonal skills, boosting their confidence

in learning, practicing subjects of knowledge, and exchanging information in a collaborative and competitive learning atmosphere in EFL classrooms.

These findings strongly resonate with the core goals of Environmental Education, as outlined by UNESCO and the Tbilisi Declaration of 1977, which emphasize fostering awareness, developing skills for environmental protection, and creating new patterns of responsible behavior (UNESCO, 1977). The learners' reported development of patience, responsibility, and motivation to seek environmental information demonstrates how PBL facilitates the acquisition of knowledge, values, attitudes, and skills needed to protect and improve the environment, consistent with these established EE objectives. Furthermore, the shift from initial reluctance to enthusiastic engagement and commitment aligns with Dewey's (1938) philosophy, which prioritizes "learning by doing" and emphasizes experiential learning (Handrianto & Rahman, 2019). Green project-based learning initiatives highlight the vitality of experiential learning in promoting active learning and in encouraging spirits of teamwork through developing learners' interpersonal skills, thus supporting the claims by Muchson (2023) and Johnson & Delawsky (2013) regarding PBL's effectiveness in enhancing 21st-century transferable skills and creating future sociable communities.

As for the science stream learners, who consist of six groups of five, the first three groups described their project-based recycling experience as different and new to teaching and learning English subjects within Tiztotin High School; it is a learning experience that they usually find familiar in mere scientific subjects. However, they approved that they had cultivated adequate environmental awareness throughout the learning process within their EFL classroom, which reawakened their ecological consciousness and significantly influenced their attitudes and behaviors in their environment. The remaining groups reflected positively on their green project-based learning journey, expressing their enthusiasm and motivation toward learning by applying theoretical knowledge in EFL classrooms. They claimed that they have learned and benefited enormously from this recycling learning experience. Moreover, they added that it was an exciting opportunity to practice their learning outcomes by producing creative recycling projects. Importantly, this perception of environmental projects being "new" to EFL classrooms but common in science subjects directly corroborates the prevalent belief discussed in the literature review that EE is often confined to scientific streams (Cates, 1997; El Moussaouy et al., 2014; Nkwetisama, 2011). This finding particularly highlights how integrating EE into EFL, as demonstrated by the recycling projects, effectively bridges

language learning with civic engagement and global awareness, inviting different fields of study to contribute to restoring environmental ethics and celebrating ecological preservation.

Generally, all the groups—literary and scientific streams—expressed their interest in green project-based learning in EFL classrooms, despite the hesitations learners revealed when project-based learning objectives and instructions were introduced. In truth, these focus-group discussions revealed significant conclusions, highlighting the importance of green project-based learning in fostering environmental awareness and encouraging ecological activism. They also inform about the practicality of green project-based initiatives in promoting learners' autonomy, accountability, and responsibility in EFL classrooms. Moreover, learners demonstrated an adequate mastery of environmentally related vocabulary by expressing their project ideas using significant vocabulary items, including sustainability, environmental awareness, responsibility, and preservation. This advantage enabled them to communicate effectively in this context and empowered them to trust and develop their communicative competencies in environmentally related discussions.

6.2. Developing responsibility, creativity, and agency through recycling and planting projects

The recycling projects were rich and diverse. Learners have crafted creative walls, homes, desks, kitchen decorations, box organizers, recycling bins, and impressive water containers in this context. Similarly, the planting projects incorporated growing lovely plants, such as cactuses, roses, mints, aloe vera, watermelons, grapes, and pelargoniums. Both processes require learner's autonomy, accountability, responsibility, agency, and creativity.

Relatedly, the questionnaire's data from the fourth chart show that the majority of learners, 95%, enjoyed the green project-based learning process in EFL classrooms, whereas the minority, 5%, did not appreciate it. Otherwise, as a result of green project-based learning, learners who worked on recycling projects learned how to reduce, reuse, and recycle their waste. On the other hand, learners who embarked on the planting journey admitted that due to this green project-based initiative, they could learn how to develop their farming and planting skills. Such a green project-based initiative is a new learning process for the majority.

Indeed, all learners believe that Green project-based learning is important in schooling programs. For them, these green-project-based initiatives are significant; they must be considered in learning and teaching processes because they raise awareness about the necessity of learning and preserving the environment from damage and depletion inside and outside schools.

Similarly, all learners expressed their interest in environmental preservation, except for two who did not. Asked about their relationships with the environment, they revealed a growing sense of accountability and responsibility toward ecological preservation due to these green project-based initiatives as revealed by chart 2. They shared their tendency to recycle most of their waste inside their houses, create more green spaces in their gardens, and use pots to plant, trim, and water as many plants as possible.

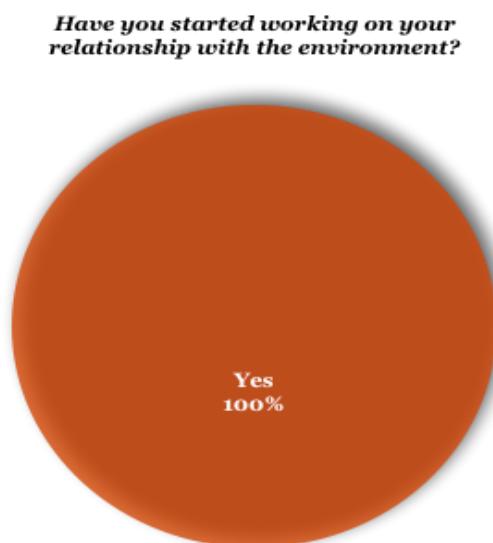


Chart 2. Learners' Green Relationship Status

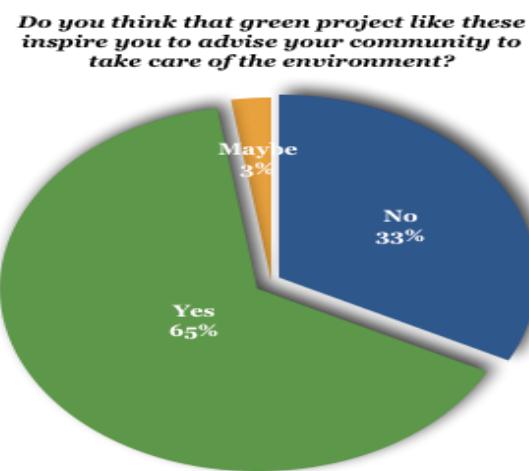


Chart 3. Project Impact on Learners' Environmental Advocacy

The outcomes of the survey's last question, chart 3, reflected a genuine willingness by learners to speak for environmental preservation. They confirmed that these green project-based initiatives inspire learners to share their learning experiences with their communities, advise them, and encourage them to preserve the environment from deforestation, toxins, and the drawbacks of waste disposal. Therefore, this willingness to advocate for environmental preservation and share learning experiences with their communities highlights the development of global citizenship and social responsibility, which Cates (1997) argues for as essential criteria for a successful English language teaching process, transcending mere linguistic proficiency.

6.3.Limitations

This study has some limitations that should be acknowledged. First, the sample was limited to 40 learners from a single high school, which restricts the generalizability of the findings to other Moroccan regions or school types. Second, the use of intact classes and the teacher-

researcher role may have introduced bias, as learners' positive responses could partly reflect their relationship with the teacher or a desire to please. Third, the quantitative analysis relied primarily on descriptive statistics without a control group, making it difficult to isolate the specific contribution of green PBL from other influences on learners' environmental awareness. Finally, the qualitative data were based on relatively short focus-group sessions and non-recorded everyday classroom interactions and observations, which may not have captured all aspects of learners' experiences. Future research could address these limitations by involving multiple schools, employing more comparative designs, and extending the duration and depth of qualitative data collection.

7. CONCLUSION

This study has demonstrated that integrating green Project-Based Learning (PBL) into Moroccan EFL classrooms can serve as an effective pedagogical approach to fostering environmental awareness, ecological responsibility, and sustainable behaviors among high school learners. The findings from Tiztouin High School reveal that green PBL initiatives, such as recycling and planting projects, not only enhance learners' engagement and environmental consciousness but also transform their attitudes and behaviors toward sustainability. Through experiential learning, learners overcame initial hesitation to achieve active participation, thus developing a sense of ownership and accountability for their ecological impact.

The results indicate that when learners engage in hands-on environmental projects, they connect theoretical content from the *Ticket to English* textbook to real-life contexts, thus bridging language learning with authentic ecological action. The process fostered key 21st-century competencies, including collaboration, creativity, communication, and critical thinking, while simultaneously enriching learners' environmental vocabulary and communicative abilities in English. The cultivation of agency and responsibility observed throughout the project cycle underscores the transformative potential of PBL as a model for education for sustainability within language learning contexts.

Beyond cognitive and linguistic outcomes, the study demonstrated affective and behavioral changes. Learners reported developing patience, empathy toward nature, and a motivation to adopt sustainable lifestyles within and beyond the classroom. Their enthusiasm for sharing ecological practices with their families and communities highlights the broader social impact of eco-pedagogical approaches in Moroccan education. These outcomes affirm

that environmental literacy can and should be cultivated through interdisciplinary methods that connect linguistic education with sustainability goals.

In conclusion, incorporating green PBL within EFL pedagogy provides a dual benefit: it enhances language proficiency through meaningful communication while instilling lifelong ecological values. The study recommends that curriculum designers, educators, and policymakers in Morocco adopt and institutionalize eco-pedagogical frameworks that integrate environmental themes into language education. Doing so will not only contribute to the development of competent language users but also to the emergence of environmentally conscious citizens empowered to advocate for sustainability and stand for positive ecological change in their communities.

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AUTHORS' BIOS

Mohammed El Haddouchi is a doctoral candidate in Translator Education and Development at the Faculty of Letters and Humanities, Oujda. He is an active member of the Applied Communication in Context Laboratory. He is a CorpsAfrica alumnus who worked on sustainable development projects in rural areas in Morocco. He holds a master's degree in

communication, culture, and translation. He brings a diverse academic background to his research pursuits. His research interests span across translation, communication, education, pedagogy, soft skills, and sustainable development.

Kaoutar Agoub is a doctoral researcher in Communication, Language, Technologies, and Education within the space and culture team at the Faculty of Humanities in Oujda, Morocco. Her research areas of interest involve ecocritical, ecopedagogical, and ecofeminist fields of study. With a scientific and literary background, she aims to develop her interdisciplinary knowledge by bridging gaps among different disciplines, including criticism and ecology.