

PROJECT LEAF: Learning through Environmental and Agricultural Formation

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Abstract:

Project LEAF (Learning through Environmental and Agricultural Formation) is an educational innovation designed to enhance learning, nutrition, and environmental awareness among Grade 4 to 6 learners. The initiative was developed in response to observations that poor nutrition negatively affects students' learning behavior. Through hands-on agricultural activities, students cultivated vegetables, harvested crops, and consumed their produce, leading to improved nutritional intake and cognitive performance. This study employed a mixed-methods approach, utilizing surveys, interviews, and observations to assess the program's impact. Findings indicated that Project LEAF fostered responsibility, teamwork, and problem-solving skills among learners. Additionally, participants demonstrated increased engagement in science-related subjects and a heightened awareness of environmental sustainability. Teachers and parents reported noticeable improvements in students' eating habits, energy levels, and academic focus. However, challenges such as space limitations and inconsistent student participation were noted. The study concludes that integrating agricultural education into the curriculum has significant benefits for student learning, health, and environmental consciousness. Addressing logistical challenges and expanding the program to other grade levels could further enhance its impact. Future research may explore the long-term effects of school-based agricultural education on academic achievement and sustainability practices.

Keywords: Agricultural education, environmental awareness, experiential learning, nutrition, sustainability

Introduction:

LEAF (Learning through Environmental and Agricultural Foundation) is an innovation for Grade 4, 5, and 6 learners. It was created after discovering that poor nutrition affects their learning behavior. Through this program, we, the teachers, guide them in growing their own plants, harvesting the crops, and cooking what they've grown. By eating what they harvest, their nutrition improves, boosting their energy and sharpening their minds for better learning.

LEAF (Learning through Environmental and Agricultural Formation) teaches learners about farming and nutrition through hands-on experience. Every morning, before classes start, each learner is assigned a garden near their classroom where they plant and care for vegetables. We teach them responsibility by giving them schedules for cultivating and watering, and we provide tools for recording observations on plant growth. This process builds responsibility, reinforces agricultural knowledge, and enhances learning across subjects, while improving nutrition.

Literature Review:

School-based agricultural programs have been widely recognized as effective interventions for improving students' nutrition, learning engagement, and responsibility. These initiatives integrate environmental education with hands-on agricultural activities, allowing learners to develop essential life skills while fostering a deeper connection to food production and sustainability. Studies have shown that integrating

agricultural education into school curricula enhances students' understanding of science, mathematics, and social studies through experiential learning (Klemmer, Waliczek, & Zajicek, 2019).

The principles of experiential learning suggest that students learn more effectively through direct engagement with their environment (Kolb, 1984). School gardens and agricultural activities serve as platforms for experiential learning, where students actively participate in planting, nurturing, and harvesting crops. Research indicates that such hands-on experiences enhance students' problem-solving skills, critical thinking, and scientific inquiry (Blair, 2009). Additionally, working with plants promotes responsibility and teamwork, essential attributes for holistic development in elementary education (Passy et al., 2020).

Proper nutrition is essential for cognitive development, academic performance, and overall well-being. Malnutrition, particularly among school-age children, has been linked to lower concentration, reduced memory retention, and poor academic outcomes (Pollitt, 1995). School gardening initiatives, such as Project LEAF, address this issue by promoting self-sufficiency in food production and providing students with direct access to fresh, nutritious produce. Studies suggest that children who engage in school gardening programs develop healthier eating habits, showing increased consumption of vegetables and fruits (McAleese & Rankin, 2007). Improved dietary intake has been associated with enhanced energy levels, cognitive sharpness, and better classroom engagement (Neumark-Sztainer et al., 2023).

Environmental education through school gardening projects fosters sustainability awareness and ecological responsibility among learners. According to Tilbury (2020), engaging students in agricultural activities encourages them to develop pro-environmental attitudes, enhancing their understanding of food systems, biodiversity, and conservation practices. When students are directly involved in food production, they become more conscious of resource management, soil health, and waste reduction, reinforcing the principles of environmental stewardship (Davis, 2019).

Agricultural education aligns well with interdisciplinary learning by connecting subjects such as science, mathematics, and social studies. For instance, students apply scientific concepts to understand plant growth, measure soil pH, and analyze weather patterns, integrating theoretical knowledge with practical application (Parmer et al., 2019). Moreover, engaging in gardening activities provides students with opportunities to develop entrepreneurial skills, such as budgeting for seeds, selling produce, and managing resources effectively (Waliczek et al., 2020).

Methodology:

Research Design

This study employed a qualitative research design to explore the effectiveness of Project LEAF in enhancing learning, nutrition, and environmental awareness among Grade 4, 5, and 6 learners. A case study approach was utilized to provide an in-depth analysis of students' experiences with the program.

Participants and Sampling

The study involved elementary school students who participated in Project LEAF. Purposive sampling was used to select students, teachers, and school administrators who were directly involved in the program. A total of 60 participants were included in the study, comprising 45 students, 10 teachers, and 5 administrators.

Data Collection Methods

Data were collected using interviews, observations, and document analysis. Semi-structured interviews were conducted with teachers and students to gather insights into their experiences and perceptions of Project LEAF. Classroom and garden observations were performed to document students' engagement with agricultural activities. Additionally, relevant documents such as lesson plans and school reports were reviewed to assess how the program was integrated into the curriculum.

Data Analysis

Thematic analysis was employed to analyze qualitative data. Transcriptions of interviews and field notes from observations were coded and categorized into themes that aligned with the study's objectives. Patterns and emerging themes were identified to provide a comprehensive understanding of the impact of Project LEAF.

Findings

Impact on Student Learning. The study revealed that Project LEAF significantly enhanced students' learning experiences. Participants demonstrated improved understanding of agricultural concepts, environmental stewardship, and responsibility. Observations indicated that students actively engaged in gardening activities, applied scientific knowledge in plant care, and showed increased curiosity about food production. Teachers reported that students exhibited higher levels of participation and enthusiasm in science-related lessons.

Nutritional Benefits. Findings suggested that students who participated in Project LEAF had better access to fresh vegetables, leading to improved dietary habits. Teachers and parents observed increased vegetable consumption among students, and some learners reported feeling more energetic and focused in class. Document analysis of school health reports indicated a slight improvement in students' overall nutritional status.

Development of Responsibility and Life Skills. Students developed a strong sense of responsibility through their involvement in daily gardening tasks. They followed scheduled routines for watering, weeding, and monitoring plant growth. Interviews with teachers highlighted that students demonstrated improved teamwork, problem-solving skills, and time management. These responsibilities extended beyond the school environment, as some learners applied their gardening knowledge at home.

Environmental Awareness. Participants displayed a heightened awareness of environmental conservation and sustainability practices. Observations showed that students took initiative in maintaining clean and organized gardens, minimizing waste, and properly managing resources. Teachers reported that students became more conscious of climate-related discussions and actively participated in school-wide environmental programs.

Challenges and Areas for Improvement. Despite its positive impact, the study identified challenges such as limited gardening space, occasional lack of resources, and varying levels of student engagement. Some students needed additional support in maintaining their assigned garden plots, while others required encouragement to consistently consume vegetables from their harvests. Teachers suggested further integration of Project LEAF into the curriculum to maximize its educational benefits.

Discussion:

Enhancing Learning Through Agricultural Education. The findings of this study align with previous research highlighting the benefits of integrating agricultural education into school curricula. The experiential learning approach provided by Project LEAF supported students in applying theoretical concepts to real-life agricultural practices. This hands-on engagement reinforced scientific principles, fostered curiosity, and improved comprehension of plant biology and environmental sustainability. These findings support Kolb's (2021) experiential learning theory, which emphasizes learning through active participation.

Nutritional Improvements and Health Benefits. The observed increase in vegetable consumption among students participating in Project LEAF confirms the positive correlation between school gardening initiatives and healthier dietary habits. Similar studies, such as those conducted by McAleese & Rankin (2007), suggest that direct involvement in food production encourages students to make healthier food choices. Improved energy levels and concentration in class further support the notion that proper nutrition plays a crucial role in academic performance (Pollitt, 2020).

Responsibility and Life Skills Development. Students' participation in daily gardening activities cultivated essential life skills such as responsibility, teamwork, and time management. These findings resonate with Passy et al. (2020), who found that school gardening programs instill discipline and a sense of accountability in learners. Furthermore, students' ability to apply gardening knowledge at home underscores the potential for long-term behavioral change and skill retention beyond the classroom environment.

Fostering Environmental Awareness. The increased environmental consciousness among students demonstrated that agricultural education serves as a powerful tool for fostering sustainability awareness. Similar results were noted in Tilbury's (2021) study on environmental education, where hands-on ecological experiences positively influenced students' attitudes toward conservation. Project LEAF's emphasis on waste management and resource conservation suggests that direct engagement with nature enhances students' understanding of their role in environmental preservation.

Challenges and Opportunities for Improvement. While Project LEAF yielded positive outcomes, challenges such as limited gardening space and inconsistent student engagement were identified. These limitations align with findings from Davis (2019), who emphasized that logistical constraints can impact the effectiveness of school gardening programs. Addressing these issues by integrating more structured agricultural activities within the curriculum and providing additional resources could enhance the program's sustainability and reach. Further teacher training and parental involvement could also support students' continuous engagement.

Conclusion:

Project LEAF proved to be an effective educational initiative that enhanced students' learning, nutrition, and environmental awareness through experiential agricultural education. The study demonstrated that hands-on engagement with gardening activities reinforced students' understanding of scientific and environmental concepts, aligning with experiential learning theories. Moreover, the program positively influenced students' dietary habits, leading to improved focus and energy levels in the classroom.

Beyond academic benefits, Project LEAF fostered essential life skills such as responsibility, teamwork, and problem-solving. Students developed a greater sense of accountability by maintaining their garden plots and applying their learning outside the school environment. Additionally, the program heightened their awareness of environmental sustainability, encouraging responsible consumption and conservation practices.

Despite the positive outcomes, challenges such as limited space, resource constraints, and varying student engagement levels were identified. Addressing these issues through better resource allocation, enhanced curriculum integration, and increased community involvement can further strengthen the program's sustainability and effectiveness.

In conclusion, Project LEAF serves as a valuable model for integrating agricultural education into the school curriculum. Future research may explore its long-term impact on students' academic performance, nutritional health, and environmental advocacy. Expanding the program to other grade levels and schools could amplify its benefits, contributing to a more holistic and sustainable educational framework.

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