

# Engagement in an Entrepreneurial School Garden Project: Impact of Gardening on Students' Environmental Attitudes

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## Abstract

This study explores the impact of the “Entrepreneurial School Garden Program” on students’ environmental attitudes, using a mixed-methods research approach. This program integrates practical gardening activities with the school’s co-curriculum to enhance knowledge and skills in food and nutrition, agriculture, and entrepreneurship. Quantitative data were collected through a survey on a sample of 214 students in the Jaffna district, where 22 schools had completed the program. Qualitative data were gathered through interviews with 5 groups of teachers, observations, and document analysis. The results revealed significant improvement in environmental attitudes ( $M=4.0494$ ,  $SD=0.7538$ ). Students perceived improvements in their environmental awareness ( $M=3.9745$ ), positive attitudes toward environmental sustainability ( $M=3.9185$ ), and adaptability to environmental changes ( $M=4.195$ ). The frequency of engagement in gardening activities influenced students’ attitudes, while female students exhibited greater improvements than male students. Qualitative data analysis revealed improvements in a sense of responsibility and achievement, enhanced social skills and teamwork, and increased environmental awareness and stewardship. The frequency and duration of engagement have an influence on motivation. Students are perceived to be more responsible and capable of dealing with environment-related problems through their improved problem-solving skills, goal-setting abilities, and self-awareness. They developed better communication skills, empathy, and teamwork to adapt themselves to the environment. The engagement in gardening resulted in an improved consciousness of sustainability and commitment to environmental stewardship.

**Keywords:** *Environmental well-being, Entrepreneurial school garden program, Behavioural attitudes, Food security, Experiential learning*

## I. INTRODUCTION

In recent years, there has been a growing interest among the curriculum designers and educational researchers on the effectiveness of extracurricular activities for developing social and emotional competencies in school students. Thus, attention is focused on the role of school-based gardening programs as a means of enhancing students' educational experiences and personal development. These programs are increasingly recognized by educators for their potential to foster a range of positive outcomes, including improved academic performance, greater environmental awareness, and enhanced social and emotional well-being (Childs, 2011). The schools in Jaffna district, with their unique cultural and environmental contexts, provide an intriguing setting to explore these potential benefits.

Since January 2023, the Food and Agriculture Organization of the United Nations (FAO), Australian Aid, Sri Lanka (Common Wealth Union) have supported entrepreneurial school gardens for students in over 200 schools spread across three provinces in Sri Lanka: Uva, Central, and North, in honor of the International Day of Education. The goal of the project is to assist awareness of school-based nutritional health and food security during the post COVID-19 and economic crisis led malnutrition and food insecurity crisis that Sri Lanka was experiencing. As part of the program, to develop skills in food security, nutrition, agriculture, and entrepreneurship, 505 school teachers from the three provinces were selected and provided training in the discovery-based teaching and learning techniques in agriculture. In addition, an awareness program was organized for students through practical activities in the selected schools for three weeks.

Then, the Entrepreneurial School Garden Program was implemented for one year in selected schools, integrating practical gardening activities into the educational curriculum. It was implemented to

enhance the knowledge, and skills among students on basic concepts of food nutrition, agriculture and entrepreneurship to improve their resilience to the food shortage that have emerged with economic crisis in Sri Lanka, while motivating students to have interest in agricultural entrepreneurship. This initiative is further intended to teach students about agriculture and sustainability and to encourage the development of positive environmental attitudes. By engaging directly with nature, students can learn the values and various skills of taking responsibility, problem solving, goal setting, stress management, critical thinking, spirituality, relationship building, team work, empathy, and positive attitude toward the environment.

This study investigates how participation in the Entrepreneurial School Garden Program has influenced the development of the environmental attitudes of students who participated in the programme. Specifically, it investigated the changes perceived in the environmental wellbeing of the students by examining the three dimensions identified through the literature (Milfont, & Duckitt, 2010): environmental awareness, positive attitudes toward sustainability, and adaptability to environmental changes. The research is grounded in the belief that hands-on, experiential learning opportunities can significantly impact attitudinal growth and development of interpersonal skills of the students.

## II. BACKGROUND OF THE STUDY

The role of co-curricular activities in developing positive attitudes in students has been a major area of focus in several research studies (Waliczek, Bradley, & Zajicek, 2001). School gardening is one of the co-curricular activities which develops students' knowledge, skills and attitudes (Waliczek, & Zajicek, 1999). In recent years, innovative searches in education are increasing on a daily basis. Especially with the emergence of the Covid-19 pandemic, it became evident that a change in the direction and form of education is a must.

Despite the recognized benefits of school-based gardening programs, there remains a gap in understanding how these initiatives specifically impact the environmental attitudes of school students, particularly in diverse cultural and environmental contexts (Dilip, Thomas, & Malik, 2020). In the Jaffna district of Sri Lanka, where

economic challenges and post-COVID-19 recovery efforts have heightened concerns about food security and nutritional health, the introduction of the Entrepreneurial School Garden Program presents a unique context to explore the impacts of the engagement in school gardening on students' attitudes.

While previous research has highlighted the potential of school gardening to improve academic performance and social and emotional well-being, there is limited empirical evidence on how such programs influence environmental attitudes in a comprehensive manner. Moreover, the specific context of the Jaffna district, with its unique socio-economic challenges, adds another layer of complexity that has not been thoroughly examined.

Therefore, this study seeks to investigate the participation of students in the Entrepreneurial School Garden Program and its impact on the environmental attitudes of students. It attempts to answer the overarching question: How does involvement in gardening activities of students enhance environmental awareness, positive attitudes toward environmental sustainability, and adaptability to environmental changes?

The study attempts to describe the behavioral impacts of school gardening programs, and offer valuable insights for educators, policymakers, and education leaders. This will help in making informed decisions regarding the implementation and expansion of such initiatives in future to maximize the benefits for holistic development of students, especially in regions facing economic and nutritional challenges.

### *The Objectives of the Study*

1. To identify the impacts of school garden on students' attitudes in terms of their environmental well-being.
2. To identify the factors contribute to the attitude development through school gardening engagement of school.
3. To examine the significant differences in attitudinal development through engaging in school garden among different socio-demographic characteristics of students.

## III. LITERATURE REVIEW

The relationship between school gardening programs and students' environmental attitudes has been extensively studied, reflecting the growing emphasis on experiential learning in

education. School gardens serve as practical platforms where students can connect with nature, learn about environmental sustainability, and develop a sense of responsibility towards the environment.

Research studies have consistently shown that participation in school gardening activities positively influences students' environmental attitudes. According to Skelly and Bradley (2007), gardening programs can significantly enhance students' awareness and appreciation of environmental issues. Similarly, studies by Dirks and Orvis (2005) have demonstrated that hands-on gardening experiences lead to improved environmental knowledge and a stronger commitment to sustainability. Previous research also suggests that female students often exhibit greater environmental concern and engagement compared to their male counterparts. This is supported by Li et al., (2022) who found that females are generally more inclined towards environmental protection and sustainability.

Beyond environmental attitudes, school gardening has been linked to the development of social skills, teamwork, and a sense of achievement. Klemmer, Waliczek, and Zajicek (2005) highlighted that gardening activities foster collaboration among students and improve their communication skills, empathy, and ability to work in teams. These findings align with the current study's results, where students reported enhanced social skills and teamwork through gardening.

The integration of gardening into the school curriculum, particularly in subjects like food and nutrition, agriculture, and entrepreneurship, has been shown to enhance students' motivation and engagement. A study by Blair (2009) found that students who participate in garden-based learning are more motivated and perform better academically. The connection between frequency of engagement and improved environmental attitudes observed in this study echoes this, emphasizing the importance of sustained involvement in such programs. This body of literature underscores the multifaceted benefits of school garden programs, supporting the idea that they not only foster environmental stewardship but also contribute to the holistic development of students.

#### IV. RESEARCH METHODOLOGY

This study employs a mixed-methods research design, integrating both quantitative and qualitative approaches to describe the impact of the Entrepreneurial School Garden Program on behavioral attitudes of students. This design allows for a robust analysis by combining numerical data with detailed personal insights, thus providing a holistic understanding of the program's effects.

The study was conducted in the Jaffna district where eleven schools had completed Entrepreneurial School Garden Program successfully from 2022 to 2023 after the pandemic of Covid-19. Five schools were purposively selected for this study considering the gender, number of students who participated from the schools and number of presently available teachers who participated in the Entrepreneurial School Garden Program. A questionnaire survey approach was used for collecting the quantitative primary data from 214 grade nine students. A purposive sampling approach was employed to ensure a representative sample across different socio-economic backgrounds and school types.

The review of the literature revealed few instruments for measuring student attitudes from the impact of a school garden on students' attitudes. After through contemplation a self – prepared and validated questionnaire was administered to students after the implementation of the programme, at its completion. These surveys measured the perceived changes in three areas of environmental well-being..

In-depth interviews were conducted with a subset of 10 students, and 5 teachers. These interviews provided qualitative data on experiences and perceptions of the Entrepreneurial School Garden Program. Group discussions were held with five groups of parents having 5 members in each group .Observational data was collected during gardening activities and related classroom sessions. Student Journals and Project Reports, Analysis of students' written reflections and project reports offered additional insights into their learning experiences and attitudinal changes

Quantitative data Analysis was conducted using the techniques of descriptive statistics: Basic statistical measures were employed to summarize the survey data. Qualitative thematic technique was used to analyze interview and focus group

transcripts, along with observational and document data. This helped in identifying common themes and patterns in the perceptions.

## V. FINDINGS OF THE STUDY

The study found that engagement in school gardening significantly improved their overall environmental attitudes, with a mean score of ( $M=4.0494$ ,  $SD=0.7538$ ). Additionally, the number of days students engaged in school gardening had a positive impact on improving their attitudes ( $\beta=0.082$ ). The most significant improvement was observed in environmental well-being. Students developed greater environmental awareness, positive attitudes towards the environment, and adaptability to environmental changes.

The study revealed significant differences in attitudinal development based on gender. Female students had a greater improvement in attitudes ( $M=4.0396$ ,  $SD=0.63558$ ) compared to male students ( $M=3.8523$ ,  $SD=0.68411$ ), with a notable improvement difference (0.1872). This suggests that female students were more positively influenced by participation in school gardening activities. Parent's occupation, family income, and religion of the participant were not found to have significant differences.

Several factors were identified as contributing to the development of attitudes through engagement in school garden program. The frequency of engagement in school gardening activities was a critical factor. Increased days of participation were positively correlated with improvements in attitudes. This highlights the importance of consistent involvement in gardening activities to foster attitudinal growth.

Students with more experience in gardening activities showed greater improvements in their attitudes. This aligns with previous findings by Williams, & Dixon, (2013), which indicated that increased experience in gardening enhances knowledge, attitudes, and overall experience.

As mentioned, female students exhibited more significant attitudinal improvements compared to male students.

Although the overall time spent on gardening activities in schools was limited, with 47.6% of students spending 30 minutes and 24.1% spending one hour, the consistent engagement played a crucial role in attitude development. Long-term involvement in school gardening activities

positively impact on active engagement, both at school and at home. The sustained interest and participation were key to the positive attitudinal changes observed.

The Entrepreneurial School Garden Program significantly enhances environmental well-being. The findings underscore the value of regular, hands-on gardening activities in fostering positive behavioral attitudes and highlight the importance of considering demographic factors such as gender in program implementation.

Through the qualitative analysis of interviews, discussions, observations, and document studies, several key themes emerged, providing a nuanced understanding of how engagement in school gardening influenced attitudes.

**Sense of Responsibility and Achievement:** Students developed a strong sense of responsibility and achievement. Interviews revealed that students felt proud and accomplished when they successfully nurtured plants. Teachers noted increased self-esteem and a proactive attitude in students, particularly when they solved gardening-related challenges. Students' journals frequently mentioned their sense of responsibility and pride in their gardening achievements.

Gardening activities significantly enhanced social skills and teamwork which indirectly improve the environmental attitudes. Discussions indicated that students learned to collaborate and appreciate mutual contributions. There was a visible improvement in teamwork and empathy among students. They were observed supporting each other during gardening tasks. Project reports highlighted collaborative efforts and the development of strong peer relationships.

Participation in gardening fostered a deep sense of environmental awareness and stewardship. Interviews showed that students became more environmentally conscious. Students took the initiative in promoting sustainable practices, such as recycling and composting, in the school garden. Reflective essays indicated a significant increase in understanding of environmental issues and their commitment to sustainability.

Female students exhibited greater engagement and attitudinal improvements compared to male students. Interviews with female students highlighted their sense of empowerment and confidence gained through gardening. Female students were more engaged and took on leadership roles in gardening activities.

Regular and frequent engagement in gardening activities was crucial for attitudinal development. Teachers and students emphasized the importance of consistent participation. Frequent participants demonstrated greater improvements in responsibility and teamwork. Journals and project reports supported the idea that regular engagement was key to positive attitudinal changes.

Long-term involvement in gardening activities sustained interest and motivation. Interviews revealed that many students continued gardening at home, showing sustained interest. Students remained motivated and enthusiastic about gardening activities throughout the program. Reflective essays and journals showed ongoing commitment and enthusiasm for gardening beyond the school environment.

The integration of regular, hands-on gardening activities fosters positive behavioral attitudes, emphasizing the importance of frequency, experience, and gender considerations in program implementation. These insights provide valuable guidance for educators, policymakers, and community leaders in expanding and refining school gardening initiatives. Being engaged in school gardening helps students to improve their behavioural attitudes positively in the three identified dimensions: personal wellbeing, social wellbeing and environmental wellbeing.

## VI. IMPLICATIONS AND RECOMMENDATIONS

The findings of this study have important implications for educators, policymakers, and community leaders. The positive impacts of the Entrepreneurial School Garden Program on behavioral attitudes highlight the value of integrating experiential learning opportunities into the educational curriculum. School gardening programs can serve as a powerful tool for holistic development, addressing not only academic needs but also fostering personal growth, social skills, and environmental consciousness. To maximize the benefits of such programs, the study recommends increasing the frequency of engagement, tailoring programs for inclusivity, sustaining long-term involvement, and integrating environmental education into the curriculum.

In conclusion, the Entrepreneurial School Garden Program has demonstrated significant positive impacts on environmental well-being. By providing hands-on, experiential learning

opportunities, the program has cultivated a range of positive behavioral attitudes, equipping students with essential life skills and fostering a sense of responsibility towards themselves, their peers, and the environment. These findings underscore the importance of school gardening programs as a valuable component of holistic education, offering insights that can guide the implementation and enhancement of similar initiatives in diverse educational contexts.

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