

The Relationship between School Gardening Programs and Cognitive Engagement among Primary Education Students

Celeste Moreno*

Department of School Psychology, Southern Coast University, Valencia, Spain

DESCRIPTION

Educational institutions continually seek learning experiences that encourage active participation, sustained attention, and meaningful knowledge acquisition. Among various educational initiatives, school gardening programs have emerged as practical activities that connect students with natural environments while supporting educational objectives. Although gardening is often associated with environmental awareness and health education, researchers and educators have increasingly examined its influence on cognitive engagement. Cognitive engagement refers to the degree of mental effort, concentration, strategic thinking, and investment students demonstrate during learning activities. This article explores the relationship between school gardening programs and cognitive engagement among primary education students. The discussion considers how gardening experiences influence attention, observation, memory, reasoning, problem-solving, curiosity, and academic participation. The article also examines educational implications and the potential value of integrating gardening activities into school environments.

Primary education serves as a foundational stage during which children develop essential cognitive skills that support future learning. During these years, students begin forming habits related to concentration, inquiry, persistence, and independent thinking. Educational experiences that stimulate active involvement can contribute significantly to cognitive development. School gardening programs provide opportunities for students to engage directly with living systems, observe natural processes, and participate in activities requiring continuous attention and reflection. Attention is among the most important components of cognitive engagement. Successful learning often depends on a student's ability to focus on relevant information while minimizing distraction. Gardening activities naturally encourage attentional processes because they involve direct interaction with materials and living organisms. Students planting seeds, measuring growth, or examining leaves must attend to details that influence outcomes. Repeated participation in these activities may strengthen concentration skills over time.

Observation skills are also strongly associated with gardening experiences. Effective gardening requires noticing subtle changes in plant appearance, soil conditions, moisture levels, and environmental factors. Students learn to identify patterns and recognize indicators of growth or decline. These observational practices encourage careful examination of details and support the development of analytical thinking. Observation serves as a foundation for scientific inquiry and contributes to broader cognitive development. Curiosity frequently emerges during interactions with natural environments. Children naturally ask questions about how plants grow, why certain conditions affect development, and what factors influence ecological systems. School gardening programs provide opportunities for these questions to be explored through direct experience. Curiosity motivates investigation, and investigation promotes deeper cognitive engagement. Students become active participants in learning rather than recipients of information.

Problem-solving represents another significant cognitive skill associated with gardening programs. Plants may fail to grow as expected, pests may appear, or environmental conditions may change unexpectedly. Such situations require students to analyze possible causes and consider appropriate responses. These experiences provide authentic opportunities for applying reasoning skills to real-world challenges. Students learn that solutions often emerge through observation, experimentation, and evaluation. Gardening projects can also strengthen mathematical thinking. Students may measure plant height, calculate growth rates, compare quantities, estimate harvest yields, and record observational data. These activities demonstrate practical applications of mathematical concepts within meaningful contexts. When students see how mathematical knowledge relates to real situations, they may become more engaged in learning and more willing to apply cognitive effort.

Language development often accompanies gardening experiences as well. Students describe observations, maintain journals, discuss findings, and present information about their projects. These activities require organization of thoughts and effective

Correspondence to: Celeste Moreno, Department of School Psychology, Southern Coast University, Valencia, Spain, E-mail: celeste.moreno@scu-education.es

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communication. Expressing observations verbally or in writing encourages reflection and reinforces understanding. Language use therefore becomes closely linked with cognitive engagement during gardening activities. One notable characteristic of gardening programs is their capacity to promote sustained involvement over extended periods. Many classroom activities are completed within a single lesson, whereas gardening projects evolve gradually. Students observe changes over days, weeks, and months. This long-term perspective encourages patience, monitoring, and continuous engagement. Sustained participation strengthens habits of observation and reflection that support broader educational goals.

Reflection is particularly important in promoting cognitive growth. Students benefit from opportunities to think about what they have observed, why certain outcomes occurred, and how experiences relate to academic concepts. Reflection encourages deeper processing of information and helps learners organize experiences into coherent understandings. Journals, discussions, and project presentations provide useful platforms for reflective thinking. Challenges associated with school gardening programs should also be considered. Limited space, financial constraints, seasonal factors, and maintenance requirements may affect implementation. However, creative

approaches such as container gardening, indoor growing systems, and community partnerships can help schools overcome these obstacles. Successful programs often depend on planning, support, and commitment from educators and school administrators.

CONCLUSION

School gardening programs have considerable potential to support cognitive engagement among primary education students. Through observation, inquiry, problem-solving, reflection, collaboration, and practical application of knowledge, gardening activities stimulate multiple cognitive processes. Students actively participate in learning while developing skills related to attention, memory, reasoning, and communication. When integrated thoughtfully into educational programs, school gardening initiatives can contribute significantly to intellectual development and sustained engagement in learning. As schools continue seeking innovative approaches to support student growth, gardening remains a valuable educational practice that connects cognitive development with meaningful experiences in natural environments.