



Extending School Gardening Programs in Elementary Education: A Phenomenological Study of Experiential Learning

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Abstract: School gardening programs have gained increasing attention as experiential learning approaches in elementary education, yet empirical evidence from developing-country contexts remains limited. This study explores the educational benefits and implementation challenges of a pilot school gardening program in an urban elementary school in Iran, drawing on social cognitive and socio-cultural learning perspectives. Using a qualitative phenomenological design, the researchers conducted semi-structured interviews with sixty-two stakeholders, including education experts, teachers, school managers, parents, and students. The researchers analyzed the data using Colaizzi's descriptive phenomenological method to capture participants' lived experiences. The findings indicate that school gardening programs foster students' behavioral and psychological development, environmental awareness, collaborative learning, nutritional understanding, and experiential skill acquisition. However, institutional and structural constraints, including bureaucratic regulations, calendar misalignment, limited resources, and stakeholder resistance, continue to challenge effective implementation. This study contributes to the literature by conceptualizing school gardening as an experiential learning ecosystem and by providing context-sensitive insights to inform educational practice and policy in elementary education.

Keywords: School Gardening Programs; Experiential Learning; Elementary Education; Phenomenological Study; Environmental Education

Introduction

Over the past two decades, school gardening programs (SGPs) have gained increasing attention as an experiential educational approach that integrates environmental education, health promotion, and social learning within formal schooling (Parks et al., 2023; Roscioli et al., 2021). Early progressive education movements historically recognized school gardening as a pedagogical strategy that extends learning beyond classroom boundaries and fosters students' cognitive, social, and emotional development (Montessori, 1964; Bowker & Tearle, 2007; Roscioli et al., 2021). Within elementary education, school gardening programs are particularly effective in shaping environmental awareness, responsibility, and pro-social behavior during formative stages of development.

Contemporary educational research emphasizes that learning is most effective when students actively engage with real-world contexts rather than passively receive abstract knowledge. Within this perspective, SGPs provide authentic learning environments that connect theoretical instruction with hands-on practice, enabling students to experience natural processes directly and develop meaningful relationships with their surrounding environment (Huys et al., 2017; Tukundane et al., 2015). Previous studies have demonstrated that participation in school gardening activities contributes to improved nutritional awareness, increased physical activity, enhanced social interaction, and positive changes in students' environmental attitudes (Berezowitz et al., 2015; Chang et al., 2016).

From a theoretical standpoint, scholars explain the educational value of school gardening programs through social cognitive learning theory and socio-cultural learning perspectives. Bandura's social cognitive theory posits that learning occurs through observation, modeling, and reciprocal interaction between individuals and their environment (Bandura, 1977). In school gardening contexts, students learn not only by performing gardening tasks but also by observing peers, teachers, and other community members, thereby internalizing attitudes, skills, and values associated with environmental stewardship. Similarly, socio-cultural theories emphasize that learning is embedded in social and biophysical practices, where participation in shared activities enables learners to move from peripheral involvement toward more skilled and meaningful engagement (Krasny & Tidball, 2009).

Despite the growing body of international literature on school gardening, existing research remains unevenly distributed across geographic and socio-economic contexts. Most empirical studies on school gardening programs focus on Western or high-income countries, where researchers benefit from relatively well-established institutional support, infrastructure, and policy frameworks for experiential education. Consequently, there is limited field-based evidence on how SGPs function in developing-country contexts, particularly in urban settings characterized by bureaucratic constraints, limited resources, and rigid school curricula. This gap restricts a comprehensive understanding of the contextual factors that shape both the benefits and challenges of implementing SGPs in diverse educational systems.

In Iran, the national elementary school curriculum has yet to incorporate systematic, practical gardening education. Although specific vocational or skill-oriented modules exist, such as the "Profession and Technology" course at the sixth-grade level, hands-on agricultural learning remains marginal and largely dependent on localized initiatives. Previous field observations indicate that many urban elementary schools lack the necessary facilities, trained personnel, and institutional flexibility required to implement SGPs on a broader scale. Nevertheless, pilot programs conducted in selected schools suggest that SGPs hold significant potential for enriching learning experiences and fostering environmental responsibility among students (Amiri et al., 2021).

Against this backdrop, the present study examines a pilot school gardening program implemented in an urban elementary school in Kermanshah, Iran. Adopting a qualitative phenomenological approach, the study explores the lived experiences of multiple stakeholders, including education experts, teachers, school managers, parents, and students. Specifically, this research aims to (1) identify the perceived educational, behavioral, and social benefits of SGP participation, (2) examine the institutional, structural, and cultural challenges associated with

program implementation, and (3) provide context-sensitive insights that can inform policy and curricular development.

By presenting empirical evidence from a developing-country context, this study makes three significant contributions to literature. First, it extends existing research on school gardening by foregrounding stakeholder perspectives from an underrepresented educational setting. Second, it strengthens the theoretical understanding of SGPs by situating experiential gardening activities within social cognitive and socio-cultural learning frameworks. Third, it offers practical implications for educators and policymakers seeking to integrate experiential environmental education into elementary school systems that face institutional and bureaucratic constraints.

Method

This study employed a qualitative, interpretive research paradigm, utilizing a descriptive phenomenological approach to explore the lived experiences of stakeholders in a school gardening program. The researchers selected this design to capture how participants perceived, interpreted, and constructed meaning from their direct involvement in school gardening activities, rather than to measure predefined variables or test causal relationships. Consistent with the experiential learning orientation articulated in the introduction, the researchers adopted phenomenology to examine subjective experiences related to learning processes, behavioral change, and social interaction within a real educational context.

The researchers conducted the study in an urban elementary school in Kermanshah City, Iran. The program targeted sixth-grade students and integrated gardening activities into existing school practices, particularly within the Profession and Technology curriculum. The local Education Organization and the research team jointly supported the pilot initiative, making it one of the earliest structured efforts to introduce school gardening as an experiential learning strategy in the region.

Participants were selected using purposive sampling to ensure the inclusion of information-rich cases with direct experience of the school gardening program. The study involved multiple stakeholder groups to capture diverse perspectives on both the benefits and challenges of implementing the program. A total of 62 participants took part in the study, including six education experts from the Education Organization, 30 teachers and school managers, 14 parents of sixth-grade students, and 12 students who directly participated in the gardening activities.

Table 1. A summary of the research method

Goals	Participants (PC)	Categories	Sample of questions	Validity and reliability criterions (Guba & Lincoln, 1994)
To study advantages of school gardening extension program	1 Key experts	N= 6	What skills did you acquire by participating in school gardening?	Credibility (member check)
	2 Instructors and school managers	N= 30	What problems did you face by participating in school gardening?	Confirmability (presenting findings to members to confirm or reject results)
To study challenges of school gardening extension program	3 Parents	N= 14		Transferability (detailed report of the interviewees' quotes in the text)
	4 Sixth graders (students)	N= 12		Dependability (Audit of findings by using external experts, for example the experts of the department of education)

The interview transcripts were analyzed using Colaizzi, (1978) descriptive phenomenological method. This analytical procedure involved several iterative steps. First, the researchers repeatedly read all transcripts to develop a holistic understanding of participants' experiences. Second, the researchers identified and extracted significant statements directly related to school gardening experiences. Third, the researchers formulated meanings from these statements to capture their underlying essence. Fourth, the researchers clustered the formulated meanings into themes representing shared experiences across participants. Fifth, an exhaustive description of the phenomenon was developed by integrating all thematic clusters. Finally, the findings were returned to selected participants for validation to ensure that the interpretations accurately reflected their experiences.

To enhance the rigor of the study, the researchers ensured trustworthiness by following established qualitative research criteria. The researchers addressed credibility through member checking, during which participants reviewed and confirmed the accuracy of the interpreted findings. The researchers supported dependability through external auditing conducted by experts familiar with qualitative research and educational studies. Confirmability was strengthened by maintaining an audit trail of analytical decisions and by presenting findings to participants for verification. Transferability was facilitated through thick description of the research context, participants, and analytical procedures, allowing readers to assess the applicability of the findings to similar educational settings.

The researchers obtained ethical approval for the study from the relevant educational authorities prior to data collection. Participation was voluntary, and the researchers secured informed consent from all adult participants, as well as from the parents or guardians of the students. The researchers assured participants of confidentiality and anonymity and used all data solely for research purposes.

Result and Discussion

1. Result

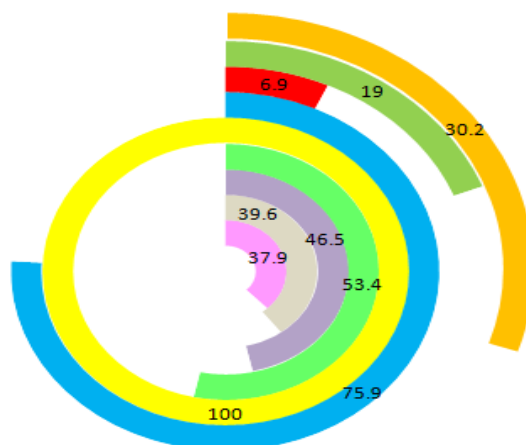
After transcribing the interviews, the researchers systematically extracted relevant phrases. Then, the 26 main themes of SGP's advantages were derived based on participants' experience. Based on thematic similarity and proximity, the researchers organized the themes and derived eight concepts capturing participants' experiences. The issues include learning through practice, promoting the gardening profession, learning with joy and competition, increased interaction and cooperation, changes in behavioral and psychological characteristics, changing nutritional attitudes, generating revenue for schools, and expanding urban gardening. Then, each topic was interpreted and explained based on interviews as well as participants' explanations (Table 2).

Table 2. The participants' experience of SGP's advantages

Concepts (Categories)	Themes	Significant statements
Learning through practice n=44	<i>Improvement of practical capabilities (n=28)</i>	<i>"Farming education at school has a determining role in improving manual skills and experiences in students."</i>
	<i>Better understanding of the content (n=16)</i>	<i>"It actually improves their perception of theoretical topics".</i>

Promotion of gardening profession n=46	Familiarization with gardening profession (n=26)	<i>"If we only emphasize on a few professions or careers, students will develop only a few capabilities and this limits their chance to develop all their potentials. This might disappoint them when they grow up and look for a job. The STF program is a chance for students to familiarize themselves with gardening profession."</i>
	Tendency to gardening profession (n=20)	<i>"We helped the students with in the process of farming education and by the end of academic year, we asked them about their preferred job when they grow up and some of them answered farming."</i>
Learning with joy and competition n=54	Creating constructive competition (n=6)	<i>"To practice planting in pots, we divide students in groups because of limited space we have. Naturally, the students started to compete to receive more pots."</i>
	Learning along with playing (n=28)	<i>"While it is quite common to see students failing to do their home works, not even a single one of them missed a farming activity such as watering. The way they were concerned about their crops showed that they were seeing it as a game."</i>
	Increasing vitality in learning (n=20)	<i>"They are much happier during physical training course and I can see the same happiness and joy during farming education course. It makes them happier and more energetic."</i>
Increased interaction and cooperation N=62	Improvement of teamwork attitudes (n=30)	<i>"After planning the vegetables, the students looked after the crops as a team and protected it from any damage by other students."</i>
	Better relationships with teachers (n=26)	<i>"The program improves the friendly relationship between students and teachers."</i>
	More interaction with parents and others (n=6)	<i>"Thanks to farming education courses at schools, students tend to talk to their parents and grandparents about farming stuff and more interested to learning from their experiences."</i>
Changes in behavioral and psychological specifications N=116	Being patient (n=26)	<i>"The students work hard on their farming project and see the results of their work in a short period of time, which is intriguing. This process also makes them more patient."</i>
	Sense of being important (n=30)	<i>"A few years ago, they brought a few oak seedlings and students planted them. Then they told their parents about their work and invited them to come to the school and see the trees. They were very eager to show their works to their parents."</i>
	Personality growth (n=7)	<i>"Farming education at school makes the curriculum more diverse and creates an open, fresh, and dynamic environment for the students. All these, help them develop their personality."</i>
	More physical activity (n=28)	<i>"The majority of students do not have adequate physical activity because of popularity of online world and Internet games. They also consume a great deal of unhealthy foods and drinks that increase their weight. Farming at school is chance of having physical activity for students."</i>
	More creativity (n=5)	<i>"Kids built a scarecrow to protect their crops at the farm against pigeons (lots of neighbors around the school keep pigeons on their roof)."</i>
	Improving ties with nature (n=20)	<i>"Students learn how to treat plants, not to break branches, avoid building campfire at green spaces and so on... they might even become more interested in keeping plants...it introduces them to new environments, which is a great opportunity given that many of them have to live in apartments away from nature."</i>

Change nutritional attitude N=88	of	Consuming healthy food stuff (n=30)	"By planting healthy food stuff without using chemical agents, the culture of using healthy and organic food expands in families."
		Familiarizing with production process (n=28)	"Through farming educations at school, my child learns where the food we use comes from and how it is produced. So far, he has only seen vegetable and food stuff in super markets and he has no idea where does it come from..."
		Promotion of using healthy food (n=30)	"There has been a growth in demand for organic foods in our society. Through developing farming at school, we can answer this need and transfer the knowledge of producing such products to family members."
Creating revenue school N=8	for	Starting profitable projects (n=2)	"We can grow saffron at school with the help of students through aeroponic system and even we can use it as an income source at school."
		Using school space for earning income (n=6)	"We have students who have managed to grow 400-500 cactus in a 12m2 room with the help of the parent and gain a considerable revenue... here at school we have plenty of open space and many interested students, but there is no income..."
Accelerated learning process N=22		Gleaning information from different sources (n=1)	"Farming education at school creates an opportunity for mutual learning. For instance, students transfer the information about new learning methods to their parents and parents share their experiences and knowledge with their children."
		Improved concentration (n=2)	"In learning environment like farming practical class, students are more interested in the material so that such classes have a higher rate of positive outcomes."
		Engagement of different sense (n=19)	"Seventy percent of learning process happens through the sense of sight. Learning with the help of hands and touching things is highly efficient and also improves emotional connection between the teacher and students."
extension of urban gardening N=35		Creating interest in urban gardening (n=30)	"When we started gardening education at the school, the parents gradually showed up to see their children's work. They were mostly interested and supportive and even asked their children to do the same work in their house yard."
		Increase in green space per capita (n=5)	"Students have not been taught how to treat plants and green spaces. We have not told them that green space per capita is 2m, while this figure is 45m in European countries. Through farming education, and planting trees, we can increase green spaces in our country."



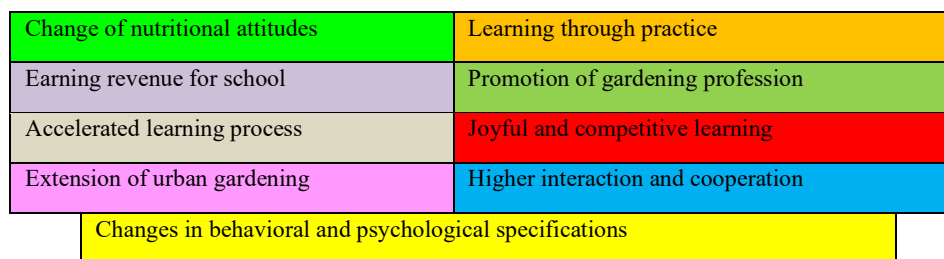


Diagram 1- Frequency distribution of SGP's advantages

Diagram 1 illustrates the ranking of the advantages of SGP. As data analyses showed, one of the most important benefits of SGP was changes in the behavioral and psychological specifications of students. Other key advantages included increased interaction and cooperation among parents, school staff, and students, as well as changes in nutritional attitudes and the promotion of urban gardening. Additionally, earning an income was at the bottom of the list.

Additionally, the researchers extracted study-related phrases concerning the challenges of the school gardening program and identified twenty main challenge themes based on participants' experiences. Subsequently, the researchers grouped similar and closely related themes, deriving seven concepts that represented participants' experiences. The issues include high costs and a tight budget, the need for skilled personnel, the need for proper environment and facilities, inconsistency between academic and farming calendars, resistance from educational and administrative personnel, reluctance from some parents, and Legal and bureaucratic problems. Then, each topic was interpreted and explained based on interviews and participants' explanations (Table 3).

Table 3. The participants' experience of SGP's challenges

Concepts (Categories)	Themes	Significant statements
Heavy costs and a tight budget N=35	Supply of inputs (n=5)	<i>"The costs of implementing the project, purchasing seeds and pesticides and so on and providing the ground for planting, as the starting steps, are too high. The school budget is enough only to pay for utilities and installation maintenance and there is no other source to cover the costs."</i>
	Tight budget of schools (n = 30)	<i>"A part of school budget should be allocated to farming education at school. The budget only covers utilities and installations maintenance and there is no room for practical programs like farming. No part of the budget talks about cultivating plants, herbal plants and so on."</i>
Needs facilities and a proper ground N=47	Lack of space (n=15)	<i>"The school garden is too small and it is not possible to hold the course for all classes. We have five sixth grader classes... and there is not enough space to have a decent experience of farming."</i>
	Need for a proper ground (n=30)	<i>"Our schools do not have the adequate physical facilities like soil, space, fertilizers and so on."</i>
	Lack of information sources (n=2)	<i>"There is a small library at the school, and there is not many sources and books about farming in it."</i>
Needs for skilled and trained staff	Need for experts in gardening (n=28)	<i>"To do it in a right way, we need an expert's help, someone with academic educations in agriculture."</i>

N=48	Lack of gardening skills in teachers (n=20)	<i>"In the case of pest attack or any botanical disease, our teachers do not have the knowledge to solve the problem. It will be a bad experience for students, if we lose the whole crops."</i>
Academic and farming calendars do not fit N=30	Lack of time (n=22)	<i>"We do not have enough time to complete the textbooks within the official academic calendar and sometimes we hold make ups. Farming education at school needs a lot of time."</i>
	Educational holidays (n=2)	<i>"We need someone to take care of plants. Students are not at school during holydays (like New Year) and someone should water the plants."</i>
	Bad timing for planting (n=6)	<i>"A big part of academic year is in the cold season (fall and winter), which is a challenge for implementing such plans."</i>
Legal and bureaucratic problems N=58	Bureaucracy (n=28)	<i>"Farming should be done in large pieces of land to make practical learning possible. While I was able to arrange a greenhouse visit with the parts of students, I was not able to arrange with the education organization. For example, once they say that we cannot choose destination more than 20km away from the school gate and then they change their mind and impose a new limitation. As a teacher I do not know what to do."</i>
	Extensive and complicate regulations (n=30)	<i>"There are bans on going to school trips during holydays and weekends and there are a lot of holydays in Iran. The point is, plants need 24/7 care."</i>
Lack of interest in some parents N=46	Not allowing plantation outside school (n=5)	<i>"If we decide to do planting on a ground outside the school, it is better to find a place close to the school. Some parents may not allow their children go too far from the school."</i>
	High expenses of the plan from parents' viewpoint (n=4)	<i>"When the school implemented farming activity for one year, the parents disagreed by stating that why do you put us to a lot of expenses and why other schools do not implement such plans."</i>
	Negative attitude about children working with soil (n=3)	<i>"Soil is dirty and my child might become ill if he touches soil."</i>
	Parents' concentration on theoretical courses (n=28)	<i>"Sixth graders' mathematics is too hard and since many of college fields suitable for boys need high math scores, I prefer mathematics make ups rather than farming education."</i>
	Some parents are not interested (n=6)	<i>"The society believes that math is the only course and medicine is the only worthy major. With this, students only have one option in their lives and they will lose their hope if they fail. Because of this, some parents do not like such programs and see them as a waste of time."</i>
Education staff's resistance N=25	Lack of interest and disagreement in some school principals (n=4)	<i>"Some school principals are not interested in practical education and manual works" ... "Our school principals prefer not to step beyond their routine. When new programs like STF are implement, many of them would feel that they have lost control and school has fallen into chaos."</i>
	Reluctance to accept the program because it is new	<i>"Because of tight schedule and high workload at school, many teachers and principals might refuse to implement the program."</i>

(n=15)	
Reluctance in teachers (n=6)	<i>"Teachers spend a great deal of time and energy on teaching students. They simply do not have the physical and mental power to do hard farming tasks with students."</i>

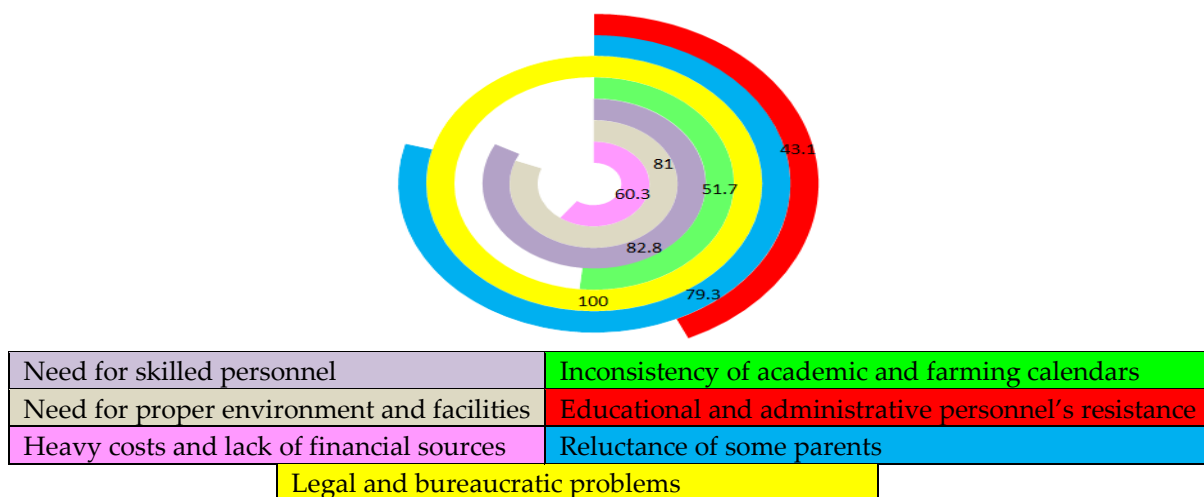


Diagram 2- Frequency distribution of SGP's challenges

Diagram 2 illustrates the percentage of each challenge. Data analyses revealed that legal and bureaucratic issues are the most significant challenges in SGP. The need for skilled personnel, facilities, and a suitable environment, as well as parental reluctance, are other challenges. Educational and administrative personnel's resistance is at the bottom of the list in terms of importance.

2. Discussion

The findings of this study suggest that school gardening programs function as a multifaceted experiential learning environment that influences students' behavioral, psychological, and social development. Rather than functioning merely as an extracurricular activity, the program examined in this study constituted an integrated learning space in which cognitive, affective, and social processes interacted dynamically. This finding is consistent with prior research, which emphasizes that learning in open and authentic environments enhances students' engagement and developmental outcomes (Bowker & Tearle, 2007; Huys et al., 2017).

From the perspective of social cognitive learning theory, observational learning and reciprocal interaction between learners and their environment explain the observed changes in students' behavior and psychological characteristics. Bandura's theory posits that individuals acquire behaviors and attitudes through observation, modeling, and reinforcement within social contexts (Bandura, 1977). In the present study, students developed patience, self-confidence, and a sense of responsibility through repeated engagement in gardening activities, observing peers and teachers, and witnessing tangible outcomes of their efforts. Similar findings have been reported in studies demonstrating that school gardening enhances self-efficacy and emotional development among students (Childs, 2011).

The findings further reveal that school gardening programs foster social interaction and collaborative learning among students, teachers, and parents. Increased teamwork, communication, and intergenerational interaction highlight the social

dimension of experiential learning. These results align with socio-cultural learning theories, which emphasize that learning occurs through participation in shared practices and social interaction within a community of practice (Krasny & Tidball, 2009). Gardening activities provided a context in which students could gradually move from peripheral participation to more active involvement, thereby reinforcing social norms, cooperation, and mutual responsibility. Previous studies examining school gardening initiatives have documented similar social benefits (Doria et al., 2017; Kann et al., 2016).

Another important finding concerns the influence of school gardening programs on students' nutritional attitudes and health awareness. Direct involvement in planting and harvesting enabled students to understand food production processes more concretely, which in turn influenced their perceptions of healthy eating. This finding corroborates earlier research indicating that experiential exposure to food cultivation improves children's nutritional knowledge and dietary attitudes (Berezowitz et al., 2015; Graham et al., 2005; Utter et al., 2016). The present study extends these findings by showing that changes in nutritional awareness were often transferred from students to their families, thereby amplifying the program's impact beyond the school environment.

Learning through practice emerged as a central mechanism underlying many of the reported benefits. Gardening activities bridged the gap between theoretical instruction and practical application, supporting student-centered learning approaches emphasized in contemporary education (Malberg Dyg & Wistoft, 2018). By engaging multiple senses and requiring sustained attention, gardening facilitated deeper understanding and improved concentration, consistent with experiential learning principles that emphasize learning through direct experience (Mirrahimi et al., 2011; Tukundane et al., 2015). These findings support the argument that experiential learning environments effectively enhance elementary education by enabling students to grasp abstract concepts through concrete activities.

Despite these benefits, the findings also reveal significant institutional and structural challenges that constrain the implementation of school gardening programs. Legal and bureaucratic barriers emerged as the most significant obstacles, reflecting the rigidity of regulatory frameworks and administrative procedures that limit schools' flexibility. Similar challenges have been reported in previous studies highlighting the role of restrictive policies and institutional resistance in hindering the expansion of school gardening initiatives (Hoover et al., 2021; Laurie et al., 2017; Mishra et al., 2022). These constraints underscore the importance of policy alignment and institutional support in enabling experiential educational practices.

The misalignment between academic calendars and agricultural cycles further complicates program implementation, particularly in regions with seasonal limitations. This structural incompatibility has also been noted in earlier research, which emphasizes that gardening activities require long-term planning and continuous care that may conflict with school schedules and holidays (Graham et al., 2005; Rogers, 2018). Additionally, the lack of trained personnel and adequate facilities highlights systemic capacity gaps that cannot be addressed solely at the school level. Previous studies have similarly identified insufficient expertise and infrastructure as significant barriers to the sustainable implementation of school gardening programs (Joshi et al., 2008; Prescott et al., 2020).

Resistance from some educational personnel and parents, although less dominant, reflects broader cultural attitudes regarding the prioritization of academic subjects over experiential learning. This finding aligns with research showing that competing curricular priorities and traditional perceptions of academic achievement often lead educators to undervalue school gardening programs (Huys et al., 2017; Prescott et al., 2020). Such resistance indicates that educators and policymakers must support not only structural changes but also cultural shifts in how formal schooling perceives experiential and environmental education to institutionalize school gardening successfully (Corbacho-Cuello & Muñoz-Losa, 2025; Day et al., 2016; Ohly et al., 2016).

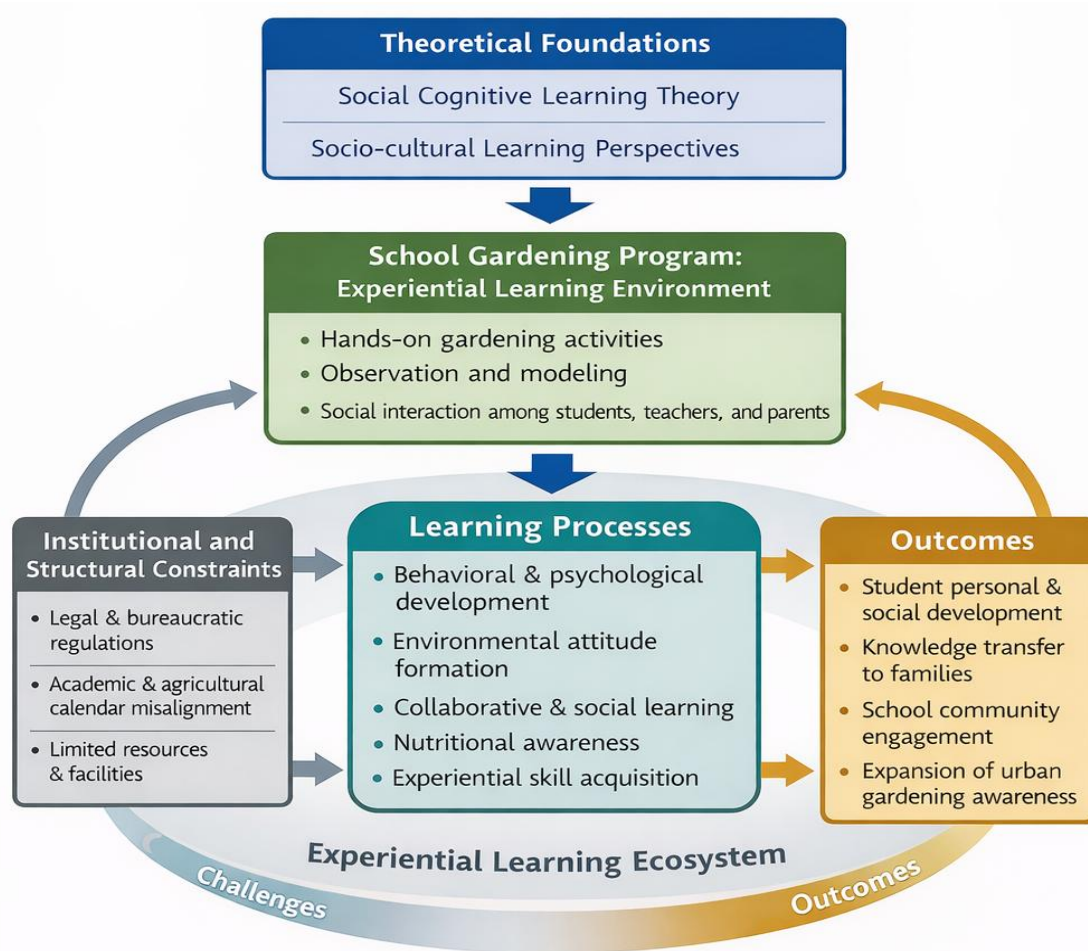


Figure 1. Conceptual framework of school gardening programs as an experiential learning ecosystem

Figure 1 presents the conceptual framework developed from the empirical findings and theoretical interpretation of this study. The framework conceptualizes school gardening programs as an experiential learning ecosystem in which learning emerges through the interaction between pedagogical practices, social actors, and the institutional context. Grounded in social cognitive learning theory and socio-cultural learning perspectives, the framework positions school gardening as a learning environment that enables observation, modeling, participation, and shared practice.

Within this ecosystem, hands-on gardening activities and social interaction function as core learning mechanisms that generate key learning processes, including behavioral and psychological development, environmental attitude formation, collaborative learning, nutritional awareness, and experiential skill acquisition. These processes lead to outcomes that extend beyond individual students to influence families, school communities, and broader awareness of urban gardening. However, the framework also highlights that the effectiveness of school gardening programs is shaped by institutional and structural constraints, such as legal and bureaucratic regulations, misalignment between academic and agricultural calendars, limited resources, and resistance from educational stakeholders. This framework underscores that educational outcomes are not produced by pedagogical activities alone but emerge from the interaction between experiential learning practices and the institutional ecosystem in which they are embedded.

Limitation this study

No research work is free of limitations, and mitigating these limitations surely enhances the credibility of the study. One limitation of the present study was its focus on only one pilot project and the unstructured nature of the participants' experiences within the project. To gain a clearer picture of SGP, we need to implement the project on a larger scale to identify its benefits and challenges more accurately. In other words, because the study population was too small for statistical analysis, this research adopted a qualitative design. In addition, the project was limited to one boys' school, and the expressed viewpoints and comments only represent boys, parent and the school staff. The study does not examine girls' viewpoints and attitudes toward the program, nor does it incorporate the perspectives of farming promoters, given the program's novelty and the promoters' limited experience with it. It is, therefore, necessary to involve farming promoters as a stakeholder group in such projects.

Conclusion

This study shows that school gardening programs operate as an experiential learning ecosystem that supports students' behavioral, psychological, and social development in elementary education. Through hands-on activities embedded in social interaction and real-world contexts, these programs enhance environmental awareness, collaborative learning, nutritional understanding, and experiential skill acquisition. Viewed through social cognitive and socio-cultural learning perspectives, school gardening enables learning through observation, participation, and reciprocal interaction, allowing students to internalize values and skills that extend beyond the classroom.

However, the findings also indicate that the effectiveness and sustainability of school gardening programs depend strongly on institutional conditions. Legal and bureaucratic barriers, misalignment between academic and agricultural calendars, limited resources, and resistance from educational stakeholders continue to constrain implementation. By providing empirical evidence from an urban elementary school context in a developing country, this study underscores the importance of aligning policy, fostering curricular flexibility, and promoting cross-sector collaboration to support the institutionalization of school gardening as a meaningful component of elementary education.

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