

**Students interest and skills in organic school gardening:
Basis in enhancing the TLE curriculum**

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ABSTRACT

The primary goal of this research was to evaluate the interest and skills of the TLE grade 7 students in organic gardening at Tanudan district. To unlock the prevailing attitude of this students toward organic school gardening in terms of environmental stewardship, appreciation for agricultural labor, and perceived importance of organic products, the level of practical skills of the students in organic gardening operations, specifically in land preparation, production of organic fertilizers/concoctions, and natural pest management, the extent of students' interest in organic gardening about classroom engagement, home application, and potential career or livelihood aspirations, a significant relationship between the students' attitude/interest and their actual practical skills in organic gardening, the researcher employed both quantitative and qualitative research methods. For the quantitative aspect, to identify the prevailing attitude, practical skills and level of interest using a Likert scale. While for the qualitative part, the observation of the researchers on all three. Statistical data used is percentage, mean and weighted mean. The findings show that students demonstrated a "Skilled" level of practical gardening competence with a total average weighted mean of 3.24, with the highest proficiency in plant care and pest management ($M = 3.35$) and the lowest in organic fertilizer production and application ($M = 3.10$). Students' prevailing attitude toward organic school gardening registered a mean of 3.05, described as "Agree," while their interest yielded an average mean of 3.18, interpreted as "Interested." Correlational analysis confirmed a statistically significant moderate positive relationship between practical skills and attitude ($r = 0.500$, $p = 0.025$) and a stronger significant relationship between practical skills and interest ($r = 0.606$, $p = 0.005$), with both null hypotheses rejected at the 0.05 significance level. Interest proved to be a more powerful predictor of practical skill acquisition than attitude. Based on these findings, Project GROW (Green Resources for Organic Wellness) was proposed as a targeted intervention integrating applied agricultural mathematics, gamified innovation challenges, peer-led mentoring, and school-to-market entrepreneurial activities to address the identified competency and motivational gaps.

Keywords: Organic school gardening, practical skills, student interest, TLE curriculum, experiential learning, intervention program.

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INTRODUCTION

Today's schools view garden projects not just as a hands-on pastime but as a vital hub for teaching sustainability and real-world life skills. Within the Technology and Livelihood Education (TLE) framework, the Agricultural Arts strand equips learners with the practical know-how needed to bolster food security and protect the environment. Yet many institutions still struggle to bridge the divide between classroom theory and the "dirty-hands" experience required for successful organic gardening. As Holloway et al. (2023) point out, school-garden initiatives have taken root worldwide—from Australia and the United Kingdom to countless other countries—highlighting the growing relevance of this educational approach. School gardening is an effective experiential learning strategy used to cultivate students' practical skills and enhance academic performance. This approach is strongly supported by empirical evidence. For instance, in their research entitled "Digging into Gardening in Elementary Classrooms," Hershey et al. (2023) found a statistically significant link: fifth-grade students participating in the garden curriculum scored higher on science achievement tests compared to their peers without the hands-on instruction. While Santiago's (2025) case study on *The Gulayan sa Paaralan* reveals its comprehensive impact. Beyond significantly enhancing student academic performance and nutrition, the program also cultivates stronger community bonds and fortifies local food security. Finally, the results from Labay et al. (2025) support the idea that school gardening programs enhance students' environmental consciousness, food security, and practical abilities, with effects that reach into household behaviors.

Moreover, practical skills are not merely advantageous; they are often the deciding factor in career success. While academic achievements certainly demonstrate intellectual capacity and theoretical knowledge, it is the ability to translate that knowledge into tangible actions and solutions that truly sets individuals apart in the job market. Someone who excels in their studies but lacks hands-on experience or the ability to problem-solve in real-world scenarios may find themselves at a disadvantage when seeking employment, as employers increasingly prioritize candidates who can immediately contribute and adapt to the demands of the role and the broader professional environment. This emphasis on practical application highlights the importance of a balanced approach to education and personal development, where the development of actionable skills complements theoretical learning. According to Sharma (2025), practical skills are those acquired by students beyond their formal academic curriculum, equipping them with abilities directly applicable to everyday life. This aligns with what Prianto et al. (2022) say, that students learn through practice, applying theories they learn in practical applications.

The educational landscape's pivot towards 21st-century skills is a powerful strategy for equipping youth with essential practical abilities. The World Health Organization (WHO) underscores the importance of core life skills such as decision-making, problem-solving, creative and critical thinking, communication, interpersonal skills, self-awareness, empathy, and emotional and stress coping mechanisms. As these skills gain traction in schools and technical vocational programs, they are actively transforming how we prepare young individuals for the future.

In the Philippines context, Technical Livelihood Education (TLE) plays a crucial role in shaping the future of high school students by equipping them with practical skills and preparing them for economic livelihood. In today's rapidly changing world, vocational education has become increasingly essential. TLE offers students a hands-on approach to learning, allowing them to acquire skills that are directly applicable in various job markets. One of the primary advantages of TLE is that it covers a broad range of subjects that cater to different interests. From cooking and baking to carpentry, sewing, and computer technology, students can explore various fields and discover where their strengths and passions lie. For

instance, students who engage in culinary arts can learn important skills such as meal planning, food preparation, and nutrition. These skills can lead to job opportunities in restaurants, catering services, or even starting their own food business. In addition to practical skills, Technology and Livelihood Education (TLE) encourages critical thinking and problem-solving. Students often work on hands-on projects that require them to think creatively and innovatively. For instance, in carpentry classes, students may be tasked with building a small piece of furniture. This real-world application not only enhances their technical skills but also teaches them how to troubleshoot and overcome challenges.

While global and national studies have highlighted the benefits of school-based agriculture, there is a significant lack of localized data within the specific cultural and geographical context of Tanudan, Kalinga. As a municipality deeply rooted in traditional farming and rich indigenous agricultural practices, Tanudan presents a unique environment for TLE instruction. However, preliminary observations suggest that modern TLE students in the area are increasingly detached from these organic traditions, and no formal assessment has been conducted to measure their actual performance and practical abilities in an organic school garden setting.

Currently, there is no documented intervention project in the district specifically designed to bridge the gap between student interest and technical skill acquisition in organic farming. This study seeks to fill that void. By assessing the current performance levels of TLE students in Tanudan, this research will serve as the empirical basis for a targeted Intervention Project, one that revitalizes student interest and ensures that the next generation of Kalinga youth possesses both the passion and the practical skills to sustain their land through organic means.

Statement of the problem

The primary objective of this study was to determine the interest and practical skills of TLE students in organic school gardening at Taloctoc General Comprehensive National High School during the 2025-2026 school year. Specifically, it sought to answer the following questions:

1. What is the level of practical skills of the students in organic gardening operations, specifically in land preparation, production of organic fertilizers/concoctions, and natural pest management?
2. To what degree are students interested in organic gardening regarding classroom involvement, practical use at home, and possible career or livelihood goals?
3. Is there a significant relationship between the students' attitude/interest and their actual practical skills in organic gardening?
4. Based on the findings, what intervention project can be developed to enhance the interest and skills of the students?

METHODOLOGY

The study employed a mixed methods approach that integrated both quantitative and qualitative designs to assess three central constructs, namely attitudes toward organic school gardening, interest in organic school gardening, and practical skills in organic gardening among the participants. Each construct was measured using a four-point Likert scale in which 4 indicates "Strongly agree/very interested/highly skilled," 3 means "Agree/interested/skilled," 2 signifies "Disagree/uninterested/moderately skilled," and 1 represents "Strongly disagree/very uninterested/unskilled." Participants provided self-ratings for their attitudes and

interests, while practical gardening skills were evaluated through both self-assessment and teacher assessment. Complementing these quantitative measures, a qualitative component was incorporated through systematic observation of participants during actual gardening activities. The researcher closely monitored the students throughout the entire gardening process, beginning from land preparation and extending to the application of organic fertilizers and concoctions, plant care, and pest management. Observations focused on practical skill mastery, including techniques employed, efficiency of task execution, and adherence to safety protocols. In addition, the researcher examined collaboration and team dynamics by documenting how students organized themselves, distributed responsibilities, and managed conflicts. Engagement levels were further assessed through observation of non-verbal cues such as expressions of interest, frustration, and overall participation that might not be captured through survey responses. Comprehensive field notes were maintained and supplemented with photographic documentation obtained with prior ethical consent to capture detailed aspects of the learning environment, resource utilization, and the integration of indigenous knowledge with modern Technology and Livelihood Education practices.

The participants of the study consisted of all 20 Technology and Livelihood Education students in the Tanudan District. The inclusion of the entire population ensured that the data reflected the complete group of learners within the specified context. The researcher's role as the classroom teacher provided a direct and sustained vantage point for observing and assessing the students' authentic interest, attitudes, and performance in school gardening activities within their natural learning environment.

To gather the necessary data, the researcher utilized a two-pronged instrumentation strategy that combined a structured questionnaire and systematic observation. The questionnaire was designed to measure attitudes, interest, and practical skills through a series of declarative statements aligned with the three constructs. These statements were answered using the four-point Likert scale without a neutral option, thereby requiring respondents to take a definitive stance. The absence of a midpoint ensured clearer differentiation in responses and strengthened the interpretability of the data. The second component of the instrumentation involved structured on site observations conducted during actual gardening sessions. This observation protocol enabled the researcher to document both technical performance such as planting, weeding, and soil preparation, and the social and emotional interactions that occurred during task execution. This dual approach allowed for the triangulation of self-reported data with observed behavior, thereby enhancing the reliability and validity of the findings.

Prior to the commencement of data collection, strict adherence to ethical standards was ensured through a comprehensive and multi-step approval process. Formal ethical clearance was obtained from the researcher's affiliated institution through submission of a detailed research protocol to the Institutional Review Board or Ethics Committee. This protocol included the study's aims, methodology, data collection instruments, participant recruitment procedures, potential risks and benefits, confidentiality safeguards, and data storage plans. Following institutional approval, formal letters were addressed to the school principal and relevant teachers to secure permission for the conduct of the study. These communications clearly outlined the objectives of the research, the expected participation of the school and its personnel, anticipated time commitments, and assurances regarding confidentiality and anonymity. Given that the participants were Grade 7 students, a rigorous informed consent process was implemented. Students were provided with age-appropriate explanations of the study, emphasizing that participation was voluntary and that they had the right to decline or withdraw at any time. Parental consent was likewise obtained. This comprehensive ethical procedure ensured the protection of participants' rights and welfare, upheld privacy and confidentiality, minimized potential risks, respected participant autonomy, and reinforced the overall integrity and credibility of the research.

The data gathering procedure followed a structured mixed methods framework that combined quantitative measurement with qualitative exploration to achieve a comprehensive understanding of the participants. The process began with the identification and recruitment of Grade 7 Technology and Livelihood Education students in the Tanudan District using purposive sampling. Given the small and geographically dispersed population of indigenous students, purposive sampling ensured the inclusion of all eligible participants, thereby maximizing the representativeness of the sample. Administrative approval was secured from the District Superintendent and the principals of the participating schools prior to data collection. Upon obtaining permission, the researcher personally engaged with the students and their parents to secure informed consent. Subsequently, participants completed the structured questionnaire, providing self-ratings on their attitudes, level of interest, and practical skills. These responses were complemented by observational assessments conducted by the researcher during actual gardening sessions. During these sessions, the researcher assumed the role of an active observer and systematically documented field observations. The observational focus included the execution of practical skills, the strategies used by students to address challenges encountered during gardening tasks, and the extent of teamwork, persistence, enthusiasm, and overall engagement demonstrated. Particular attention was given to instances in which indigenous knowledge and practices were integrated into the gardening activities. The combination of structured survey data and in-depth observational records enabled methodological triangulation, thereby strengthening the comprehensiveness and robustness of the data collected.

The data analysis process was conducted in two integrated phases that addressed both qualitative and quantitative dimensions of the study. The initial phase emphasized qualitative depth by examining students' attitudes and interest through detailed observational data. The researcher gathered rich narrative insights derived from direct observation of students' behaviors and interactions during gardening activities. These observations provided contextual understanding of the students' subjective experiences and were further triangulated with teachers' perspectives, which offered additional insight into the impact of gardening activities on students' learning and development. All qualitative data were systematically organized and recorded using a matrix to preserve the integrity and detail of the observations. A rigorous thematic analysis was then applied to identify recurring patterns and emergent themes across the observational records.

The second phase of analysis focused on quantitative breadth through statistical treatment of the collected data. Descriptive statistics were first utilized to establish baseline characteristics of the participants, including demographic variables such as age and gender that may influence engagement. Students' performance in terms of attitudes, interest, and practical skills, as measured by the Likert scale, were organized and presented in tabular form to facilitate clarity and interpretation. From these organized data, mean values and percentage scores were computed to provide a comprehensive summary of performance trends. To determine whether significant differences existed among performance groups, Analysis of Variance (ANOVA) was employed. Furthermore, weighted means were interpreted using a predefined verbal scaling system, such as "Very interested" and "Highly skilled," to translate statistical outputs into meaningful and actionable interpretations. This integrated analytical approach ensured that both numerical trends and contextual insights were systematically examined, resulting in a methodologically sound and comprehensive interpretation of the data.

RESULTS AND DISCUSSION

The Results and Discussion section presents the findings derived from the responses of Grade 7 students enrolled in Technology and Livelihood Education within the Tanudan District, focusing on their attitudes, practical skills, and level of interest in organic school gardening, as well as the relationships among these variables. The study involved a defined group of respondents whose data were collected using a structured survey instrument and analyzed through descriptive statistics, including mean and average mean, alongside inferential statistics such as Pearson r correlation analysis tested at a 0.05 level of significance. The discussion that follows is grounded strictly in the empirical data obtained and interprets the findings in direct alignment with the objectives of the study, ensuring that all statistical values and indicators are retained and accurately contextualized.

The prevailing attitude of students toward organic school gardening reveals a generally positive orientation, as reflected in an overall average mean of 3.05, interpreted as “Agree.” The highest mean score of 3.75 for the statement “I believe organic gardening is essential for protecting the environment” demonstrates a strong level of environmental stewardship among the respondents, indicating that students recognize organic gardening as a critical ecological practice rather than merely an academic requirement. This is further reinforced by the mean scores of 3.30 and 3.15 for indicators reflecting pride in working in the school garden and willingness to engage in physically demanding tasks, respectively, both interpreted as “Agree.” These values suggest that students exhibit a favorable disposition toward agricultural labor, challenging traditional perceptions that manual farming is undesirable. However, a notable divergence appears in their practical preferences, as indicated by the mean score of 2.80 for the statement “I prefer organic methods over synthetic/chemical fertilizers,” which falls under “Disagree.” Similarly, students disagree with statements that school gardening is a waste of time (2.50) and that chemical pesticides are easier and better than organic methods (2.70), both interpreted as “Disagree.” This pattern indicates that while students intellectually support the principles of organic agriculture and reject negative perceptions of gardening, they remain cautious about the efficiency and practicality of organic inputs. The data therefore suggest a cognitive alignment with environmental ideals, accompanied by a pragmatic evaluation of agricultural methods, a phenomenon supported by Kelemen et al. (2025), who emphasized that experiential learning in school gardens fosters environmental awareness but does not automatically translate into full behavioral adoption of sustainable practices.

In terms of practical skills, the students demonstrate a high level of competence across all assessed domains, with a Total Average Weighted Mean of 3.24, interpreted as “Skilled.” Among the three domains, plant care and pest management yielded the highest average mean of 3.35, with the indicator “Can demonstrate proper transplanting of seedlings without damaging roots” achieving the highest individual mean of 3.50. This indicates that students have developed precise motor coordination and careful handling skills essential for successful transplantation. Land preparation also reflects strong competence, with an average mean of 3.28, highlighted by a mean of 3.45 for correctly preparing a garden plot and 3.10 for demonstrating double-digging or soil aeration, both within the “Skilled” category. The domain of organic fertilizer production and application recorded the lowest, yet still “Skilled,” average mean of 3.10, with individual means of 3.15 for creating Fermented Plant Juice or Fish Amino Acid and 3.05 for composting practices such as vermicomposting or pile composting. The slightly lower performance in composting suggests that students encounter greater difficulty in managing time-intensive and process-oriented tasks compared to more immediate and observable activities. The overall findings confirm that students have effectively translated theoretical knowledge into practical competence, particularly in tasks requiring physical engagement, while still needing reinforcement in technically complex processes. This

distinction between physical proficiency and process-based understanding aligns with findings from Parslow et al. (2025) and Diel et al. (2025), who reported that learners tend to excel in hands-on agricultural tasks but require additional support in mastering the scientific and procedural aspects of sustainable farming.

The level of students' interest in organic gardening is similarly high, with an overall average mean of 3.18, interpreted as "Interested." Indicators related to classroom engagement, such as enjoyment of discussions (3.40) and eagerness to participate in hands-on activities (3.40), demonstrate strong academic involvement. The presence of an additional indicator with a mean of 3.50 further reinforces this high level of engagement. The negative indicator "I find gardening activities in school boring and repetitive" yielded a mean of 2.65, interpreted as "Uninterested," which supports the conclusion that students do not perceive gardening activities as monotonous. Interest extends beyond the classroom, as indicated by means of 3.15 for both starting an organic garden at home and seeking additional information outside class hours, suggesting that students recognize organic gardening as a relevant life skill. However, the indicator related to career consideration yielded the lowest positive mean of 3.00, still within the "Interested" range, indicating a relatively moderate inclination to pursue organic farming or agri-business as a future career. This suggests that while students are engaged and motivated, their interest has not fully translated into long-term vocational commitment, likely due to limited exposure to the economic potential of agriculture. The observed pattern reflects a distinction between situational interest and sustained career aspiration, consistent with contemporary literature emphasizing the need for experiential and entrepreneurial exposure to strengthen agricultural career pathways.

The correlational analysis provides further insight into the relationship between psychological factors and practical competence. The relationship between practical skills and prevailing attitude yielded an r -value of 0.500 with a p -value of 0.025. Since the p -value is less than or equal to 0.05, the null hypothesis is rejected, indicating a significant moderate positive relationship. This means that students with more positive attitudes toward organic gardening tend to demonstrate higher levels of practical skill. The relationship between practical skills and interest yielded a higher r -value of 0.606 with a p -value of 0.005, which is also less than 0.05, leading to the rejection of the null hypothesis and confirming a significant relationship. The higher correlation coefficient indicates that interest has a stronger association with skill development than attitude. The findings suggest that while positive beliefs about environmental stewardship contribute to skill acquisition, active engagement and intrinsic motivation play a more influential role in enhancing technical competence. The statistical evidence demonstrates that interest functions as a more powerful driver of learning, as students who are eager to participate and explore beyond the classroom are more likely to master complex gardening tasks. This interpretation is consistent with experiential learning theory, which posits that active participation is essential for skill mastery.

Observational data from the researcher further substantiate the quantitative findings by providing contextual insights into student behavior and learning processes. Students demonstrated effective technical execution in land preparation, fertilizer application, and pest management, with strong manual dexterity and proper use of tools. However, difficulties were observed in applying mathematical concepts such as mixing ratios, indicating a gap in integrating scientific knowledge with practical application. Behavioral engagement was evident through consistent plant care practices and adherence to safety protocols, reflecting responsibility, discipline, and intrinsic motivation. Students exhibited ownership of their garden plots, aligning with the high interest levels recorded in the survey. Social dynamics within the garden environment revealed strong collaboration and peer mentoring, with students assisting one another in completing tasks, although some inconsistencies in equal participation

were noted. These observations confirm that the learning environment fosters both technical and socio-emotional development, with peer interaction serving as a natural mechanism for skill enhancement.

Overall, the findings demonstrate that Grade 7 students possess a positive attitude toward organic school gardening, a high level of practical skills with a Total Average Weighted Mean of 3.24, and a strong level of interest with an average mean of 3.18. The significant relationships identified between practical skills and both attitude ($r = 0.500$, $p\text{-value} = 0.025$) and interest ($r = 0.606$, $p\text{-value} = 0.005$) confirm that psychological factors play a critical role in skill development, with interest emerging as the stronger predictor. The results highlight that while students are environmentally conscious and technically capable, targeted instructional strategies are needed to strengthen their understanding of complex organic processes and to enhance their perception of agriculture as a viable career path. These findings contribute to the field of agricultural education by emphasizing the importance of experiential learning, intrinsic motivation, and integrated skill development, and they provide a strong empirical foundation for the subsequent formulation of instructional interventions and action plans aimed at improving the effectiveness and sustainability of organic school gardening programs.

CONCLUSION

The findings of the study demonstrate that Technology and Livelihood Education students exhibit a high level of readiness for organic gardening, as evidenced by their “Skilled” level of practical operations with a mean of 3.24 and their “Interested” level of engagement with a mean of 3.18. Central to these findings is the statistically significant strong positive correlation between student interest and practical skills, with $r = 0.606$, which confirms that intrinsic curiosity serves as a more influential driver of technical competence than general attitude alone. While the students display commendable manual dexterity and uphold a noble perspective toward environmental stewardship, the results also reveal the presence of a utility gap, wherein synthetic fertilizers are still perceived as more efficient than organic alternatives. Qualitative evidence further indicates that although students excel in hands on activities and naturally engage in peer-to-peer mentoring, they encounter difficulty in tasks requiring mathematical precision, particularly in the formulation and mixing of organic concoctions. These findings collectively suggest that while the program has successfully cultivated a sense of ownership and green consciousness among learners, there remains a critical need to transition from predominantly manual engagement toward a more technically grounded and science-based approach to organic agriculture.

Building on these findings, the study underscores the necessity of transforming the gardening program into a more rigorous and economically relevant vocational pathway. Integrating applied agricultural mathematics into the curriculum emerges as a key recommendation to bridge the gap between students’ practical abilities and their technical understanding, particularly through the use of visual mixing guides and simplified ratio representations that can enhance comprehension and accuracy. Sustaining student engagement also requires the introduction of innovative strategies such as gamified practical challenges, which can stimulate motivation while reinforcing skill development. In addition, formalizing existing peer mentoring structures is essential to ensure equitable participation and to cultivate leadership among students, thereby maximizing the collaborative strengths already observed within the program. The establishment of a school to market initiative further strengthens the program by demonstrating the tangible financial benefits of organic farming, effectively reshaping student perceptions of agriculture from a noble but limited activity into a viable and profitable career option.

The study also highlights a significant opportunity for students to progress from basic participation to advanced technical expertise in organic agriculture. Despite their demonstrated competence and positive environmental attitudes, the persistence of the utility gap and the challenges associated with mathematical accuracy indicate the need for a targeted and structured intervention. In response, the proposed Project GROW, or Green Resources for Organic Wellness, is conceptualized as a comprehensive program designed to address these specific gaps. By integrating applied agricultural mathematics, structured innovation activities, and entrepreneurial learning experiences, the program aims to align students' idealism with practical realities. The incorporation of peer led instruction, supported by the designation of high performing students as leaders, ensures the continuity and scalability of mentoring practices, while evidence-based demonstrations of organic effectiveness are expected to gradually shift perceptions regarding the efficiency of organic methods.

The structured implementation of Project GROW across a ten-month period further reinforces its potential to enhance both technical competence and student ownership of learning. The initial phase focuses on diagnostic assessment and the organization of students into peer led groups, followed by intensive training in mathematical applications relevant to organic gardening through the Green Math Clinic. Subsequent phases emphasize land preparation, planting, and comparative experimentation through activities such as the Concoction Challenge, which is designed to validate the effectiveness of organic inputs relative to synthetic alternatives. As the program progresses, students engage in pest management, reflective evaluation of their intrinsic interest, and the application of acquired skills within their home environments, thereby extending learning beyond the classroom. The culmination of the program in a Harvest Market Day provides students with direct experience in marketing, financial computation, and community engagement, thereby reinforcing the economic dimension of organic agriculture.

In synthesis, the study affirms that while students possess strong foundational skills and positive dispositions toward organic gardening, the advancement of the program requires deliberate integration of technical knowledge, mathematical competence, and entrepreneurial orientation. The proposed intervention not only addresses identified gaps but also aligns with the broader objective of developing a sustainable and future oriented agricultural education framework. By bridging the divide between manual proficiency and scientific understanding, and by linking educational experiences to real world economic opportunities, the program contributes meaningfully to the development of skilled, environmentally conscious, and career ready learners. These conclusions provide a solid basis for subsequent discussions on implementation strategies, policy formulation, and further research aimed at strengthening organic agriculture education within the Technology and Livelihood Education curriculum.

REFERENCES

- Aikaterini. (2020). Education for sustainability development via school garden. *European Journal of Education Studies*. ISSN: 2501-1111.
- Acharya, et al. (2020). Small change is beautiful: Exploring possibilities of eco-san on school garden for transformative pedagogy. *Higher Education Studies*, 10(2). ISSN: 1925-4741.
- Acharya, Dr., et al. (2023). Gardening at school for new good life: Entrepreneurship for sustainable education in the public schools in Nepal.

Cosco, et al. (2022). Hands-on childcare garden intervention: A randomized controlled trial to assess effects on fruit and vegetable identification, liking, and consumption among children aged 3-5 years in North Carolina. *Frontiers in Psychology*, 13. <https://doi.org/10.3389/fpsyg.2022.993637>

Demapendan, et al. (2024). Technology and livelihood education learning brochures for Grade 7 students. *Journal Evaluation in Education*, 5(4), 177-189. <https://doi.org/10.37251/jee.v5i4.1113>

Hershey, H., & Parks, M. (2023). Digging into gardening in elementary classrooms. *International Journal of Undergraduate Research and Creative Activities*, 14(1), Article 3. <https://doi.org/10.7710/2168-0620.0360>

Holloway, et al. (2023). School gardening and health and well-being of school-aged children: A realist synthesis. *Nutrients*. <https://doi.org/10.3390/nu15051190>

Hunter, et al. (2025). Agrobiodiversity, school gardens and healthy diets. https://iirr.org/wp-content/uploads/2021/10/CGSpace-Home-Bioversity-International-Bioversity-Books-View-Item_compressed.pdf

Gamil, et al. (2025). Gardening program in schools and homes of learners and the perception of the usefulness of school-based gardening. *Psychology and Education: A Multidisciplinary Journal*, 40(1), 93-102. <https://doi.org/10.70838/pemj.400107>

Seeds Canada. (2018). Gardens for learning. <https://seeds.ca/schoolfoodgardens/wp-content/uploads/2018/03/Creating-and-Sustaining-your-School-Garden.pdf>

Ikendi. (2023). Influence of school garden learning approach on academic development of global service-learners. <https://doi.org/10.5032/jae.v64i4.167>

Kos, et al. (2020). Gardening activities at school and their impact on children's knowledge and attitudes to the consumption of garden vegetables. *Problems of Education in the 21st Century*, 77(2), 270-291. <https://doi.org/10.33225/pec/19.77.270>

Kelemen, et al. (2025). School gardens as commons: Fostering relational values for biodiversity through participatory environmental education. *International Journal of the Commons*, 19(1), 431-443. <https://doi.org/10.5334/ijc.1539>

Labay, et al. (2025). Gardening program in schools and homes of learners and the perception of the usefulness of school-based gardening. *Psychology and Education: A Multidisciplinary Journal*, 40(1).

Monday. (2024). Community engagement with technology and livelihood education (TLE): Teachers' point of view. *International Journal of Advanced Multidisciplinary Studies*, 4(6).

Montales. (2024). Agricultural activities implemented in secondary schools relative to food security: A systematic literature review. <https://doi.org/10.55248/gengpi.5.1224.3551>

Onay, et al. (2024). Impacts of organic farming on the environment. In *New horizons in environmental health* (pp. 1-15). Orient Publications.

Prianto. (2022). Does student involvement in practical learning strengthen deeper learning competencies? *International Journal of Learning, Teaching and Educational Research*, 21(2), 211-231. <https://doi.org/10.26803/ijlter.21.2.12>

Rahaman, et al. (2025). School gardens as a pedagogical tool in teaching and learning of agriculture in senior high schools in Ghana. *European Journal of Education Studies*. ISSN: 2501-1111.

Rahman, et al. (2021). Impact of practical skills on academic performance: A data-driven analysis. *IEEE Access*. <https://doi.org/10.1109/ACCESS.2021.3119145>

Sagario. (2023). Experiential learning approach to improve students' common competencies and attitude towards agricultural crop production. *International Journal of Social Science Humanity & Management Research*, 2(9), 850-860. <https://doi.org/10.58806/ijsshmr.2023.v2i9n04>

Sena. (2022). Impact of school garden on the teaching and learning of agricultural science in Peki College of Education, Ghana. *Global Scientific Journal*, 10(8).

Sharma. (2025). Career readiness: Importance of practical skills in higher education. <https://www.hurix.com/blogs/career-readiness-importance-of-practical-skills-in-higher-education/>

Sumandal, et al. (2022). Students' level of engagement in learning technology and livelihood education in the new normal. *International Journal of Multidisciplinary Studies*, 6(3), 45-50.

Walshe. (2024). School gardens and student engagement: A systematic review exploring benefits, barriers and strategies. *Issues in Educational Research*, 34(2). <https://www.iier.org.au/iier34/walshe.pdf>

Panorama Education. (n.d.). Comprehensive guide to 21st century skills. <https://www.panoramaed.com/blog/comprehensive-guide-21st-century-skills>