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INCLINATION ON BIO-INTENSIVE GARDENING AND ITS RELATION TO CROP PRODUCTION SKILLS OF GRADE 9 TECHNOLOGY AND HOME ECONOMICS LEARNERS

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ABSTRACT

Teaching can be closely linked to gardening by integrating real-life agricultural experiences that help students understand economic, environmental, and social issues. This study examined the learners' inclination toward bio-intensive gardening and its relationship to their crop production skills of Grade 9 Technology and Home Economics Learners for the School Year 2024–2025. It aimed to provide evidence to strengthen students' interest in bio-intensive gardening and enhance their agricultural competencies. The study employed a mixed-methods approach using a sequential explanatory design, wherein quantitative data were gathered and analyzed first, followed by qualitative data to provide deeper insights into the findings. Structured interviews supported the qualitative phase, while purposive sampling was used in selecting the respondents. Findings revealed that the respondents demonstrated a very high level of inclination toward bio-intensive gardening across understanding, attitude, practical experience, and general perception. Likewise, the learners exhibited a very high level of crop production skills, particularly in land preparation, weed control, chemical application, and the establishment, maintenance, and harvesting of crops. A significant relationship was found between the learners' inclination toward bio-intensive gardening and their crop production skills. However, respondents also encountered very high challenges related to limited planting materials, insufficient farm tools and equipment, inadequate laboratory and farm facilities, and limited access to qualified instructors and mentors. The study concludes that strengthening students' inclination toward bio-intensive gardening can significantly enhance their crop production skills through experiential and school-based agricultural learning activities.

KEYWORDS: *Bio-Intensive Gardening, Crop Production Skills, Grade 9 Students*

INTRODUCTION

Teaching can be reconnected to gardening by using real examples from agriculture to help students understand economic, environmental, and social issues. For instance, many agricultural products such as bananas, prawns, coconut oil, tuna, seaweed, carrageenan, and Cayenne pineapple are exported to countries like the United States, Europe, Japan, and ASEAN nations, showing how local farming contributes to the global economy. However, the agricultural sector also faces challenges, such as the conversion of farmlands into parks, golf courses, and residential subdivisions. In 1993 alone, about 2,300 hectares of irrigated rice land were lost each year because small landowners often found it more practical to sell their land since they lacked the resources to buy seeds, fertilizers, pesticides, and labor. By connecting these realities to school gardening activities, teachers can help students appreciate the importance of agriculture, food production, and sustainable land use while developing practical skills and environmental awareness.

Regardless of its intentions to become industrialized, the Philippines is an agrarian nation. The majority of rural residents rely on agriculture as their primary source of income. Farming, livestock, forestry, and fisheries are the four subsectors that make up the Philippines' agricultural sector. That accounts for 20% of our nation's GDP and employs about 39.8% of the workforce. Rice, sugarcane, bananas, coconuts, coffee, mangoes, corn, abaca, tobacco, and pineapple are the principal crops. Cassava, cotton, rubber, eggplant, calamansi, camote, peanuts, garlic, cabbage, and onion are examples of secondary crops.

Chemical-based insecticides and fertilizers are used excessively, which eventually reduces soil production. despite the fact that farmers have been switching to organic farming in recent years. An alternate way to address these issues is through biointensive gardening, which uses a tiny amount of land while producing wholesome food that is necessary for everyone. Promoting biointensive gardening contributes to the global eradication of food shortages and scarcity. Malnutrition will also be eradicated since it offers wholesome food (Ochona, 2023).

The development of the society's various facets, including its political, social, and economic facets, has been the main focus of several endeavors. The production of various crops to supply food, a basic human need, is a component of the economic sector. One of the most important economic sectors is recognized to be agriculture. It entails using natural resources like water and land to produce plants, livestock, fiber, fuel, and more. The Latin words "ager" (field) and "cultura" (cultivation and production of crops and livestock products) are the origins of the word agriculture. (Gamage et al., 2023).

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Similarly, although it is a less prevalent source of income in wealthier countries, agriculture benefits everyone on the planet, either directly or indirectly. People rely on it to start small businesses, sustain their families, and earn a living (Dorosh and Thurlow, 2016; Abhilash et al., 2021). Numerous career opportunities have emerged as a result of the increasing demand for agricultural products on a global scale. In Mathlouthi et al. (2022), Agriculture makes up a sizable amount of many people's jobs. The agriculture industry, which also offers suppliers, drainage systems, construction projects, and other services, has provided a living for a large number of people in both developed and developing countries. Agriculture has many benefits, and its significance cannot be overstated. It provides developmental, economical, and basic benefits. Every country on the planet gains from it in some way, and it is essential to both developed and developing countries' way of life (Dubey et al., 2022).

Modern agriculture is a progressive approach to agricultural innovations and farming practices that includes high-yielding seed varieties, chemical fertilizers, irrigation water, pesticides, and other farming techniques (Gamage et al., 2022). People must deal with a variety of man-made and natural threats while learning about food safety. In addition to meeting food security concerns, there is an increasing need for food in order to generate foreign exchange.

A bio-intensive agricultural approach maintains the fertility of the soil. Utilizing Bio-Intensive Gardening (BIG) for production can guarantee the farm's survival. In comparison to conventional agriculture, BIG uses a lot less land to produce the same amount of crops. If BIG were applied worldwide, significant plant and animal variety would be preserved (Folnovic, 2020). It involves buddy cropping while using BIG. Companion cropping may provide a number of advantages for enhancing soil quality, lowering the burden of disease and insect pests, and lowering risk. In order to lower production costs and diversify their rotations, growers are looking to implement companion crops (Kirkegaard and Condon, 2019).

This study would improve the inclination on bio-intensive gardening of the students and its influence on their crop production skills. This primary goal of the study is to examine inclination on bio-intensive gardening of the Grade 9 students at Abuyo National High School and how it influences their crop production skills. Additionally, it aimed to determine the impact of respondents' crop production skills and inclination on bio-intensive gardening and ascertained the inclination on bio-intensive gardening and its relation to crop production skills of Grade 9 Technology and Home Economics learners at Abuyo National High School.

METHODOLOGY

This study used a mixed-method design to measure the inclination towards bio-intensive gardening and its relation to crop production skills of Grade 9 Technology and Home Economics learners at Abuyo National High School. Sequential explanatory design was used in analyzing the qualitative part of the study on the challenges encountered by the respondents on their challenges of improving crop production skills. A self-administered Likert-scale survey measured inclination on bio-intensive gardening and its relation to crop production skills of the respondents. Structured Interview was used to gather data on the challenges encountered by the respondents in doing bio-intensive gardening. The answers of the respondents were analyze using thematic analysis. Descriptive statistics (mean) and Pearson's correlation coefficient were used to analyze the data and examine relationships among variables. Thematic analysis was used in analyzing the qualitative part of the study on the challenges encountered by the respondents on their challenges in doing bio-intensive gardening.

RESULTS AND DISCUSSION

The results show that the respondents had a high degree of self-reported comprehension of bio-intensive gardening ideas and techniques especially that the occupation of the respondents is gardening. Although still substantial, the understanding component is marginally less strong than attitude and experience. This can suggest that further in-depth training or a more thorough integration of theory and practice is required. Although students may actively participate, there may be gaps in scientific knowledge of the ecological and sustainability concepts underlying gardening methods.

Further, it further suggests that the majority of respondents selected "strongly agree" or "agree" in response to attitude questions regarding bio-intensive farming, indicating very favorable opinions and sentiments about it. Respondents' scores are closely clustered around the mean, as indicated by the tiny standard deviation (0.24), indicating a high degree of agreement over their optimistic outlook.

The respondents' assessment on the level of inclination on bio-intensive in terms of practical experience has a mean of 3.58 and SD 0.23 which is described as very high. The extremely high mean for practical experience shows that students are actively participating in gardening activities in addition to being aware of them. Particularly in science and agriculture, experience-based learning improves motivation and skill sets. The finding of the study shows that the occupation of the parents contributes to the result. This shows that students not only have a very good attitude but also actively participate in and have a positive opinion of bio-intensive gardening techniques. The low standard deviations show that there is little variation in these favorable tendencies and that they are shared by the entire group.

The "very high" means show that the respondents regularly practice or has advanced skills in all important areas of crop production. The low standard deviations (SDs) imply that all respondents have a high degree of agreement or skill uniformity. Research indicates that trainees or graduates who participate in school- or community-based competency development programs attain high levels of crop production expertise, especially in the areas of crop establishment, maintenance, and harvesting. Similar to the setting of respondents, this is ascribed to outcomes-based courses and significant experiential learning components. In addition, it indicates a "very high" competency level, the respondents rated their crop production skills in employing chemicals very well. This indicates that participants—possibly

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farmers or agriculturists—strongly believe they are competent in using chemicals for crop management. Although hesitation continued because of perceived efficacy gaps.

This suggests that more skill and potentially higher performance in actual gardening or production tasks are associated with motivation or a good attitude toward the gardening method. According to this research, it implies that the students who are more likely to engage in bio-intensive gardening typically have better agricultural production skills. In order to improve practical abilities in Grade 9 TVL-Agriculture programs, schools should take advantage of this by encouraging engaging activities like practical workshops. This could increase employability in sustainable farming and is consistent with the experiential learning ideas in the DepEd curriculum. The challenges include resource and material constraints and learning environment and support.

CONCLUSIONS

The finding indicates a strong positive disposition and readiness to engage in sustainable agricultural practices are indicated by the finding that Grade 9 students have a very high overall inclination toward bio-intensive gardening, including understanding, attitude, practical experience, and general perception. This inclination reflects their awareness and appreciation of the principles of bio-intensive gardening, which include maintaining soil health, maximizing yield while minimizing resource use, and using environmentally friendly crop production techniques. Further, the respondents are competent and self-assured in carrying out important agricultural duties including the entire production cycle, such as preparing and controlling weeds, using chemicals, and establishing, maintaining and harvesting crops. Students who have a strong interest, motivation, and positive attitude toward bio-intensive gardening are likely to exhibit higher proficiency and competence in crop production skills, according to the significant correlation found between the degree of inclination of Grade 9 TVL students toward bio-intensive gardening and their production skills. Due to a lack of resources and materials, as well as a poor learning environment and support system, Grade 9 TVL students have a very difficult time developing their crop production skills. In particular, the lack of adequate farm tools and equipment and restricted access to high-quality planting materials are examples of resource and material constraints that impair their capacity to participate in practical agricultural tasks. Inadequate laboratory and farm facilities, as well as restricted access to experienced instructors and mentors, are further issues pertaining to the learning environment that negatively impact students' motivation and development of practical skills. When taken as a whole, these difficulties hinder experiential learning and limit students' chances of gaining critical skills in agricultural production. Improving the agricultural education experience and proficiency level of Grade 9 TVL students requires addressing these issues.

RECOMMENDATIONS

Based on the findings and conclusions of this study, several recommendations are proposed to enhance how the schools may formally integrate bio-intensive gardening into the agriculture curriculum, as Grade 9 students show strong readiness and positive attitudes toward it. First, the teachers may focus on hands-on practices such as soil preparation, close plant spacing, companion planting, crop rotation, and seed saving to deepen understanding of sustainable agriculture; continuous training and resources for teachers and students are essential for effective implementation; and partnerships with local agricultural organizations or community farms can provide technical support and real-world exposure, while awareness campaigns and community gardening activities can further strengthen students' commitment to sustainable food production.

Second, maintaining competency-based assessments focused on safety, tool use, and all stages of crop production; enhancing the curriculum with a strong mix of theory and practical work; guaranteeing ongoing access to TESDA-standard tools, equipment, and quality inputs; and forming partnerships with nearby farms and agricultural organizations to offer real-world learning and career opportunities are all ways to sustain students' crop production skills and confidence.

Third, to ensure students have resources for experiential agricultural learning, fund or partner for high-quality tools, equipment, and supplies while upgrading farm/lab facilities, including secure plots and controlled environment modules. Hire/train expert agriculture mentors and link with farmers, TESDA trainers, and local specialists for guidance. Boost engagement via contests, exhibits, and community initiatives promoting food security and sustainability.

Fourth, educators can boost students' interest in bio-intensive gardening by using engaging methods such as workshops, demonstrations, and school garden projects that combine lectures with hands-on activities. Establishing bio-intensive display gardens allows students to practice techniques like composting, double digging, and companion planting under supervision. Schools should also support teacher training aligned with bio-intensive principles and integrate these approaches into Agriculture and TVL curricula to ensure sustained support, resources, and effective skill development. Further, some measures should be initiated for the application of Abuyo National High School as a farm school.

Fifth, other researcher may conduct similar study including other variables that are not included in the study.

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Table 1

Respondents' Assessment on the Level of Inclination on Bio-Intensive Gardening

Bio-Intensive Gardening	Mean	Std Deviation	Level
Understanding of Bio-Intensive Gardening	3.42	0.35	High
Attitude Towards Bio-Intensive Gardening	3.70	0.24	Very High
Practical Experience	3.58	0.23	Very High
General Perception	3.57	0.23	Very High
Overall Mean	3.57	0.20	Very High

Table 2

Respondents' Assessment on their Level of Crop Production Skills

Crop Production Skills	Mean	Std Deviation	Level
Preparing Land and Controlling Weeds	3.55	0.31	Very High
Using Chemicals	3.58	0.24	Very High
Establishing, maintaining and harvesting crops	3.65	0.28	Very High
Overall Mean	3.59	0.21	Very High

Table 3

Summary of Correlations between the level of inclination of the respondents on Bio-Intensive Gardening and Level of the production Skills

Variables Correlated	Computed r-value	p-value	Decision	Remarks
Inclination of the respondents on bio-intensive gardening and level of the production skills	0.48	0.03	Reject Null Hypothesis	Significant

Table 4

Challenges encountered by the respondents in doing bio-intensive gardening

Theme	Sub-Theme
Resource and Material Constraints	Limited Access to Quality Planting Materials
	Insufficient Farm Tools and Equipment
Learning Environment and Support	Inadequate Laboratory and Farm Facility Conditions
	Limited Access to Qualified Instructors and Mentors

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