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SEEDS OF CHANGE: AN INSTRUCTIONAL DESIGN FOR AN URBAN GARDENING EDUCATION PROGRAM FOR LESS PRIVILEGED RESIDENTS OF BARANGAY BATONG MALAKE, LOS BAÑOS, LAGUNA

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19 November 2024

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Acceptance Page

This special/capstone project prepared by **JASON GABRIEL C. ALFONSO** with the title: **"SEEDS OF CHANGE: AN INSTRUCTIONAL DESIGN FOR AN URBAN GARDENING EDUCATION PROGRAM FOR LESS PRIVILEGED RESIDENTS OF BARANGAY BATONG MALAKE, LOS BAÑOS, LAGUNA"** is hereby accepted by the Faculty of Education, U.P. Open University, in partial fulfillment of the requirements for the degree of Bachelor of Education Studies.

_____ _____

LEYNARD S. GRIPAL
Adviser (Date)

_____ _____

CELESTE LAUREL TAYZON, PHD
Program Chair (Date)

CHARISSE T. REYES, PhD
Dean
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Biographical Sketch

Jason Gabriel C. Alfonso is a resident of Brgy. Batong Malake, a barangay located next to a Center of Excellence in Agriculture Education, University of the Philippines Los Baños (UPLB). He is a student of the Bachelor of Education Studies program at the UP Open University (UPOU). He has previously studied at the University of the Philippines Rural High School, where he contributed to the campus paper *The Ruralite*, honing his skills in journalism and research writing. His parents completed their plant pathology degrees at UPLB, and his special project is his way of giving back to his own community.

Jason enrolled at the UP Open University in the midst of the COVID-19 pandemic, in which he gradually acquired skills in designing instructional materials. He presented his instructional design project, Seeds of Change, which aims to provide an accessible, beginner-friendly urban gardening program for low- and middle-income residents of his community, promoting food security and environmental stewardship.

Jason is expected to graduate from UPOU in December 2024. He has planned on conducting more research work at International Rice Research Institute (IRRI) and UPLB, and potentially enrolling to a master's degree in a university overseas.

Acknowledgement

I would like to express my deepest appreciation to those who have contributed to the success of my Special Project. I am thankful for my EDS 199 Faculty in Charge, **Sir Leynard S. Gripal**, for his unwavering support and guidance throughout my journey in applying my skills and knowledge in instructional design to practice.

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Moreover, I would like to thank my content expert, **Mr. Marco Espino**, who oversees the Edible Garden at University of the Philippines Los Baños, for his invaluable contributions to the instructional design of my urban gardening education program, Seeds of Change. His knowledge in urban agriculture and his passion for community development enriched my instructional design materials and ensured the effectiveness and relevance of the program.

I am also grateful for UPLB-CAFS faculty member **Sheryl G. Iballa, MaEd. LPT.**, for her insightful feedback and suggestions on improving the content, instructional design, and technical design of my program, which helped in enhancing the accessibility of my instructional materials.

I would like to express my heartfelt thanks to my family for their unwavering support and encouragement throughout this term. Their love and belief helped me overcome challenges and stay motivated.

Finally, I would like to acknowledge **Ms. Cheryll Laviña-Gonzales** of the Los Baños Municipal Agricultural Office, UPLB iCrops (Institute of Crop Sciences) director

Dr. Eureka Ocampo, and **Barangay Captain Hon. Ian Kalaw** of Barangay Batong Malake, for their valuable inputs to this Special Project. Their expertise and resources played a part in the development and implementation of the Seeds of Change urban gardening education program.

TABLE OF CONTENTS

List of Tables

List of Figures

List of Acronyms

ADDIE	Analysis, Design, Development, Implementation, and Evaluation
DILG	Department of Interior and Local Government
FFJ	Fermented Fruit Juice
FPJ	Fermented Plant Juice
HAPAG	Halina't Magtanim ng Prutas at Gulay
LGU	Local Government Unit
RBI	Registry of Barangay Inhabitants
SDGs	Sustainable Development Goals
SNAP	Simple Nutrient Addition Program
TVET	Technical and Vocational Education and Training
UbD	Understanding by Design
UN	United Nations
UP	University of the Philippines
UPCAT	UP College Admission Test
UPLB	University of the Philippines Los Baños

Abstract

This study presented the instructional design for *Seeds of Change*, an urban gardening education program aimed at empowering underprivileged residents of Brgy. Batong Malake, Los Baños, Laguna Malake to cultivate their own food, addressing the issue of food insecurity. Guided by pedagogical approaches such as the ADDIE Model*, Seeds of Change* program sought to foster a sustainable, inclusive approach to urban food production, with a focus on practical, cost-effective techniques, particularly container gardening, vertical gardening, and hydroponics.

Eight topics were selected from a pre-survey conducted from April to May 2024, gauging the respondents' familiarity and interest with certain areas of urban gardening, as well as their experience in gardening.

An "evaluation day" for 15 residents of "Riverside", an impoverished residential area which best represented the target demographics of the program, was held on August 25, 2024. The pilot test, however, was met with several limitations, particularly the use of English language when most of the participants could not understand it, leading to a decline in post-test performance. Nevertheless, these learners were able to acquire and apply new urban gardening knowledge as they honed their gardening skills and experience, reinforcing the constructivist learning theory.

Despite the challenges faced by the target learning audience, the *Seeds of Change* program could be used as a blueprint for urban gardening education programs tailored for marginalized individuals and households using resources available to their communities.

Keywords: urban gardening; instructional design; underprivileged residents; food security; food insecurity; plant biology; composting; hydroponics; sustainability

I. INTRODUCTION

Rationale

Statement of the Problem

Despite their proximity to UPLB, a Center of Excellence in Agriculture, many of the less privileged residents of Brgy. Batong Malake, Los Baños, Laguna could not access education provided by the University; moreover, they faced the challenge of food insecurity, which had been exacerbated by the effects of the COVID-19 pandemic because of rising food and transportation costs. Moreover, while some of these residents had an interest or previous experiences in urban gardening, they did not always have a sizeable plot of land to grow on. Lastly, although many of these learners preferred learning at their own pace, not all of them had access to electricity or a stable Internet connection.

With these in mind, an urban gardening education program shall be developed, based on the existing resources of the residents and their familiarity and interest in certain areas of urban gardening.

Significance of the Study

Urban gardening is the practice of growing plants, including fruits, vegetables, and other crops in an urban setting, taking in various forms such as community gardens, rooftop gardens, and indoor growing. This practice is particularly critical in promoting food security, particularly in underprivileged communities without fresh food options nearby, and its role in environmental stewardship and climate resilience. However, not all residents in Barangay Batong Malake could start an urban garden, despite their interest

in doing so, in a community ironically known for an institution regarded as the country's "Center for Excellence" in agriculture. Hence, there was a need to provide a comprehensive urban gardening education program for less privileged residents of the barangay to better equip them with relevant skills and knowledge in urban gardening. The need for more urban gardens had been underscored by the lingering effects of the COVID-19 pandemic, including food shortages or increased costs of food in underserved communities. Additionally, urban gardening benefitted urban areas through establishing a sense of belonging and improved air and water quality.

The target locale of the urban gardening education program was Barangay Batong Malake, particularly its indigent residents, one of the largest and most populated barangays of the municipality of Los Baños, Laguna. Los Baños, regarded as the "Science and Nature City" of the Philippines, houses the University of the Philippines Los Baños (UPLB), the country's Center of Excellence in Agriculture and the largest campus of any constituent of the UP System in terms of land area. Provided the proximity of the community to an important constituent of the UP System and the institution's credentials, it was obligatory to equip underprivileged residents of the community with the necessary skills and resources to pursue urban gardening and apply their learnings into promoting food security, socialization, and environmental stewardship.

Eventually, an instructional booklet with selected topics in urban gardening was developed. The topics were selected based on the target learners' familiarity and interest as recorded in a needs assessment pre-survey conducted in several puroks throughout Barangay Batong Malake.

This program was taught as a 28-page booklet containing useful information related to selected skills in urban gardening, including tips for budding urban gardeners and engaging visuals. The material taught step-by-step instructions for making concoctions or growing plants in vertical setups of recycled containers, a simple hydroponics system known as SNAP, as well as engaging graphics that demonstrated the best or appropriate gardening mediums or practices for their environment. It also discussed common pests and diseases, preventative measures and natural remedies, as well as economic opportunities through processing ideas and marketing techniques. The use of booklets allowed learners to acquire new information and skills on urban gardening at their own pace, even without electricity or an Internet connection.

A physical, face-to-face seminar with a resource speaker was initially considered for this program; however, plans for a seminar were scrapped due to time constraints.

Following Mayer's (2020) "personalization principle", the materials utilized conversational language rather than formal language with few technical terms to ensure their effectiveness. The demographics of the target audience were considered during the developed of the instructional materials. However, one notable limitation was the use of English as the medium of instruction, as not all target learners had basic proficiency in the language.

Scope and Limitations of the Study

This study focused on the implications of the instructional design of an urban gardening education program, particularly simple, beginner-friendly techniques such as vertical gardening and SNAP (Simple Nutrient Addition Program) hydroponics, on low- to

middle-income residents of Barangay Batong Malake, in Los Baños, Laguna, particularly 15 residents of “Riverside”, a residential area by Molawin Creek. Complicated crop cultivation methods that require expensive equipment and the use of synthetic fertilizers and pesticides were not discussed in favor of simple solutions and organic gardening practices, such as compost and plant-based pest control. Moreover, ornamental plants, rice, corn, and timber were notably excluded from the urban gardening education program as it focused on growing fresh produce on small land areas to alleviate food insecurity.

Objectives of the Study

General Objective

This study aimed to develop an effective instructional material on urban gardening tailored for low- and middle-income residents in Brgy. Batong Malake, Los Baños, Laguna.

Specific Objectives

After completing this program, the learners were expected to:

1. recall basic knowledge and skills in urban gardening;
2. explain the importance of urban gardening in maintaining food security and promoting environmental protection;
3. identify various methods of and skills in urban gardening, including hydroponics and vertical gardening;
4. appraise the aforementioned methods of urban gardening based on their viability on various settings in an urban community; and

5. create an urban gardening plan with methods appropriate for the community to help enhance food security and protect the environment.

Executive Summary

Despite their proximity to the University of the Philippines Los Baños, a Center of Excellence in Agriculture, several of the less privileged residents of Brgy. Batong Malake, Los Baños, Laguna could not access quality education provided by the University; moreover, they also faced the challenge of food insecurity, which has been exacerbated by the effects of the COVID-19 pandemic because of rising food and transportation costs. Moreover, while some of these residents had an interest or previous experiences in urban gardening, they did not have a sizeable plot of land to grow on. Lastly, many of these learners preferred learning at their own pace.

With these in mind, an urban gardening education program was to be developed, based on the existing resources of the residents and their familiarity and interest in certain areas of urban gardening. This urban gardening program shall focus on convenient, beginner-friendly urban gardening techniques, such as container gardening, to offer a simple yet comprehensive education for underprivileged individuals and households, as well as to promote food security, environmental stewardship, and socialization within the community.

Research Questions

This paper poses the following research questions:

1. What are the implications of a comprehensive urban gardening education program for less-privileged residents of Barangay Batong Malake, Los Baños?
2. Why are these residents unable to access agricultural education from UP Los Baños, despite their community's proximity to the Center of Excellence for Agriculture?

II. REVIEW OF RELATED LITERATURE

Urban gardening is the act of growing crops, such as fruits and vegetables in urban areas, taking in various forms such as community gardens, rooftop gardens, and indoor growing. Urban gardening encourages not only food security, particularly in underprivileged communities without fresh food options nearby, and its role in environmental stewardship and climate resilience, but also in the beautification and increased biodiversity of urban areas as well as the improvement of the people's physical and mental well-being and their overall quality of life.

Importance of Urban Gardening

Reasons for individuals to start urban gardens in their communities include the promotion of healthy, active lifestyles to boost the overall well-being of communities, expand access to green spaces to marginalized and underserved communities, allow diverse populations to social and establish a sense of belonging, protect the environment by reducing the "urban heat island effect" and improve the quality of the air people breathe, and equalize access to fresh produce in "food deserts", areas otherwise not served by grocery stores that sell fresh food (Leimbach & Musa, 2023).

A variety of techniques are employed in urban gardening to compensate for the lack of fertile agricultural land in densely populated areas, such as hydroponics, which uses mineral-enriched water instead of soil, and rooftop, vertical, or indoor gardens.

Urban gardening promotes cleaner, healthier habitats in urban communities, not only for humans but also other species of animals; additionally, it also encourages people

within a community – and across communities – to socialize, sharing good gardening practices among family and friends, establishing bonds and a sense of community (Appetite for Change, 2022).

Urban Gardening in the Philippines

At a webinar conducted by the Development Academy of the Philippines in 2021, former Philippine Secretary of Agriculture William Dar underscored the importance of promoting urban agriculture in improving food security amid the onslaught of the COVID-19 pandemic, as he stated that urban areas dependent on produce grown in rural areas must face increasing costs of food in an economy disrupted by the effects of prolonged lockdowns, not only in emerging economies such as the Philippines, but also in developed countries (Merle, 2021).

An example of an urban gardening initiative already implemented in local government unites (LGUs) across the Philippines is HAPAG (Halina't Magtanim ng Prutas at Gulay), an initiative of the Department of Interior and Local Government (DILG) that encourages LGUs, particularly barangays, to start their own community gardens in vacant lots to promote sustainable gardening practices, environmental stewardship, and food security, as well as to educate youths on "the importance of local food systems" and provide a source of livelihood for residents (DILG, 2023).

Theoretical Framework

Informed by various pedagogical theories developed by educational psychologists including Dewey, Piaget, and Vygotsky, the constructivist theory assumes that learners

participate actively in the learning process and that they build new knowledge from their experiences on top of their prior knowledge, mending these new ideas into their experiences (Kurt, 2021). It also assumes that learning is a social process as collaboration and interaction with others is vital in constructing knowledge. Additionally, learning is an active process that requires students to actively participate in discussions and activities to construct knowledge (Kurt, 2021). Constructivist learning theories also underscore the importance of motivation in improving how learners learn as they reflect on their prior experiences and knowledge.

Four key ideas determine the success of a constructivist approach in a learning environment, wrote Kurt (2021): (1) the instructor acts as a “facilitator” rather than merely a “director”; (2) both the instructor and the learners share authority and responsibility; (3) learning takes place in small groups; and (4) the instructor and the learners exchange ideas. In the case of *Seeds of Change*, the enrolled students in the upcoming urban gardening education program may share “best practices” in gardening in a similar way the facilitators teach these students novel techniques in farming, such as hydroponics and vertical gardening.

Conceptual Framework

ADDIE Model

The ADDIE Model is one of the most popular instructional design models, consisting of five stages: analysis, design, development, implementation, and evaluation (University of Washington - Bothell, 2023). In the first stage of this model, *Analysis*, the instructional problem is clarified; the instructional goals and objectives are devised, and the learners’

needs, as well as their learning environment, are identified. The *Design* phase, a systematic approach, informs how the learning content and activities are organized and presented; the learning objectives are created, so are the suitable design assessments, and the creation and organization of course content. The needs of the learners and the context that were identified in the analysis phase shall be considered, as well as the instructional media to be used. The *Development* phase entails the creation of instructional materials and activities, including lesson plans and assessments, as well as the selection of appropriate instructional media for the learning context, as planned in the Design phase. The fourth stage, *Implementation*, involves the training of the facilitators on delivery methods, organization of learning content, and the creation of assessments. Finally, the *Evaluation* stage reflects the instructional design process, determining the success of the program in following set objectives and the acquisition of students' expected learning outcomes.

ADDIE is a cyclical process that involves constant improvement of the instructional materials to better accommodate the needs of the target learning audience. Hence, it is possible to revisit earlier phases after implementation and evaluation have taken place (Power, 2023).

Understanding by Design

Devised by Grant Wiggins and Jay McTighe, Understanding by Design (UbD) is a learner-centered pedagogical approach that seeks to enhance the students' learning experience through "backwards design" (Bowen, 2017). Whereas "forward design", which is prevalent in most instructional design models, considers the development of learning

content and activities first and then attempts to connect them to the set learning objectives, “backwards design” considers the learning goals, objectives, and the desired learning outcomes, followed by the design of learning content and activities (Wiggins & McTighe, 2005).

According to Wiggins and McTighe (2005), the three stages of UbD are as follows: (1) *identify the desired learning outcomes* by formulating the learning goals, examine existing curricular standards, and review what is expected in the curriculum; (2) *determine whether or not the target learners have achieved the expected learning outcomes* through “performance tasks” and other assessments; and (3) *plan learning experiences and instruction* through transfer of learning, meaning-making, and association. Backwards design, Wiggins and McTighe (2005) wrote, helps prevent the “twin sins” of instructional design, “activity-focused” and “coverage-focused” teaching, both of which do not provide sufficient answers to key questions of effective learning, as learners may not understand concepts taught to them even after completing the learning activity.

Therefore, it must be recognized that the specifics of instructional planning, including teaching methods and the structure of learning content, may only be accomplished once the required learning goals are established. (Wiggins & McTighe, 2005).

Sustainable Development Goals

Seeds of Change aligned with four Sustainable Development Goals (SDGs) as identified by the United Nations (n.d.): SDG 2 (Zero Hunger), SDG 4 (Quality Education), SDG 11 (Sustainable Cities and Communities), and SDG 15 (Life on Land).

The United Nations' (n.d.) second SDG is to alleviate hunger and food insecurity, as well as to promote sustainable agricultural practices and improve access to fresh, produce. The effects of the COVID-19 pandemic underscored the importance of urban gardening, as access to fresh food has become more critical, particularly for marginalized communities, who may be more likely to consume processed foods, which prioritize convenience and affordability over nutrition and sustainability. *Seeds of Change encouraged* these communities to grow their own food to enjoy fresh produce on demand as they saved money.

The project also aimed to address United Nations' fourth SDG, to "ensure inclusive and equitable quality education and promote lifelong opportunities for all" (United Nations, n.d.). Despite Brgy. Batong Malake's proximity to the University of the Philippines Los Baños, the largest campus of the UP System in terms of land area and the country's Center for Excellence in Agriculture, not all residents, particularly its less privileged ones, are able to access quality education offered by the University. Hence, the Seeds of Change initiative aims to equip these residents with the necessary skills and resources to pursue urban gardening and apply what they shall learn into promoting food security and environmental stewardship.

Urban gardens benefit urban communities, such as towns and cities, by contributing to a cleaner, healthier environment, not only for humans but also other species of animals; hence, the study aligned with the eleventh SDG, which emphasizes safer and more sustainable human habitats (Appetite for Change, 2022; United Nations, n.d.). Moreover, urban gardening brings residents of a community - and multiple communities - together, in which families, friends, and neighbors share good gardening

practices while establishing bonds and a sense of community (Appetite for Change, 2022).

Lastly, the fifteenth SDG aims to maintain and restore terrestrial ecosystems to prevent biodiversity loss (United Nations, n.d.). In the case of urban gardening, growing various species of plants in an urban community can help attract more animals, particularly pollinators such as bees and birds (US Department of Agriculture, n.d.). Amid the looming threat of climate change, urban gardens can "provide additional habitat that is lost elsewhere" (US Department of Agriculture, n.d.).

Operational Definition of Terms

Container Gardening - the practice of growing plants, including fruits and vegetables, in appropriately sized containers (UC Agriculture and Natural Resources, n.d.)

Crop Rotation - the practice of growing a sequence of different plants on the same location to improve soil fertility (Cherlinka, 2023)

Crop Selection - the practice of selecting the best or most suitable crops for several factors, such as soil type, climate, etc.

Hydroponics - a method of growing and cultivating plants with water mixed with nutrient solution instead of soil as a medium

Low-Income Household - a household with an annual income of less than ₱50,000

Multicropping – the act of planting multiple varieties of crops on a single piece of land

Organic Gardening - the practice of growing plants without synthetic fertilizers or pesticides that may be harmful to the environment

Pest and Disease Management - prevention and mitigation of pests and diseases in crops

Purok - an informal division of a barangay consisting of up to 50 households; although it is not an official local government unit, it serves as the barangay's "implementing arm" (Galing Pook, n.d.)

Simple Nutrient Addition Program (SNAP) - a simple, cost-effective hydroponics system ideal for small-scale home-based gardening (Santos & Ocampo, n.d.)

Thermal Shock - the abrupt exposure of plants to extreme temperatures

Urban Gardening - the practice of growing plants, including fruits, vegetables, and other crops in an urban setting (Akers, 2023)

Vertical Gardening - a method of growing and cultivating plants utilizing vertical space – i.e. walls and trellises – instead of traditional soil beds

Hypotheses

A comprehensive urban gardening education program in Barangay Batong Malake would increase self-sufficiency, promote environmental stewardship, and improve the overall well-being of the community's marginalized residents, some of whom did not have the financial and material resources to start a garden, or did not have sufficient arable space to do so, with the help of sustainable, cost-effective agricultural practices.

Additionally, there were significant barriers preventing these residents from accessing agricultural education from UP Los Baños; factors include a lack of awareness and financial constraints, including the relatively high costs of review centers for UPCAT, the admission test of the University of the Philippines System, and the "income advantage", in which students from wealthier upbringings are more likely to be admitted to most UP campuses than their poorer counterparts (Daway-Ducanes et al., 2022).

III. METHODOLOGY

Research Design

This study utilized quantitative research design, particularly the descriptive design approach. According to McCombes (2019), the goal of descriptive research is to accurately and methodically describe a population, situation, or phenomenon; it can be used to answer “what”, “where”, “when”, and “how: questions, but not “why” questions.

Descriptive research design can employ a wide range of research methods to investigate one or more variables; unlike experimental research, the researcher does not control or manipulate any of the variables, only observes and measures them (McCombes, 2019).

Research Instruments

A needs assessment pre-survey was conducted in a course of two weeks, from April 21 to May 4, 2024, in Barangay Batong Malake, Los Baños, Laguna, using printed questionnaires passed out to each potential respondent. Each questionnaire mostly contained multiple-choice questions for categories such as previous gardening experience, interest and motivation, and challenges and barriers to access to a gardening space. A modified 5-point Likert scale was utilized to gauge the respondents’ familiarity and interest towards certain topics related to urban gardening, with 1 showing the least familiarity or interest and 5 being the highest.

Respondents were selected through quota sampling, a sampling method used when the population of interest is large, but there are no pre-made lists to select each

respondent (Lammers & Badia, 1982). The samples chosen are a microcosm of the larger population of interest. The sample might not accurately reflect the population that we want to generalize to, even if the quotas are met and it matches the population percentages for subsets (Lammers & Badia, 1982).

In the “familiarity” and “interest” portions of the questionnaire, the respondents ranked urban gardening topics with a modified 5-point Likert scale; a rating of “1” was given to topics that each respondent was not “familiar” with or “interested” in, while “5” was the highest rating for familiarity and interest. Based on the results of the pre-survey, eight topics were ultimately selected: (1) basic plant biology, (2) crop rotation, (3) vertical and container gardening, (4) pest and disease management, (5) proper watering, (6) organic concoctions and fertilizers, (7) hydroponics, and (8) harvesting and marketing.

Locale of the Study

The preliminary phase of the study, a needs assessment pre-survey, took place in Barangay Batong Malake, which is the largest barangay of the municipality of Los Baños in terms of land area, consists of eight puroks (zones), namely: Purok 1, which covers the intersection between Lopez Avenue and a section of the National Highway; Purok 2, which consists of El Danda Street; Purok 3 (one side of Bangkal Street); Purok 4 (Umali Subdivision); Purok 5 (Raymundo); Purok 6 (Grove, Santa Fe, and Riverside Subdivision); Purok 7 (Jamboree Site); and Purok 8 (Forestry Compound).

The evaluation phase, on the other hand, was held in “Riverside”, a low-income neighborhood by Molawin Creek, in which 15 of its residents participated on the “evaluation day for learners” and each received a copy of the *Seeds of Change* booklet.

Respondents of the Study

The intended audience for this urban gardening education program was “less privileged”, low-income individuals and households who wanted to start their own urban gardens for the purpose of subsistence amid growing food insecurity but do not have the financial means or materials to do so. The target learners stated that they have some degrees of familiarity with various topics and skills related to urban gardening, including crop selection, compositing, and organic gardening practices, but have significantly varying levels of interests in such topics.

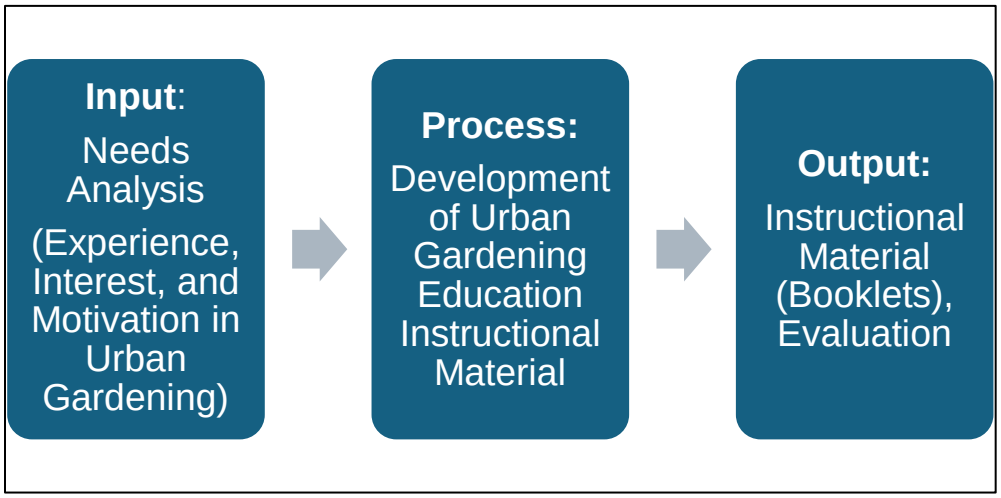
Most of the participants in the pre-survey stated that they have gardening experience and expressed their interest in starting their own urban garden, most of whom wanted to do so on small plots of land of 10 square meters or less. Most of the participants learn had monthly incomes below PHP10,000 and have an average age of 50.39 years.

The target learners of this urban gardening course were expected to have basic knowledge in gardening. They shall also have a grasp in certain branches of earth sciences, including geology and meteorology, as topography and climate may have effects on the appropriateness of certain species of plants in the environment. In addition, they are also expected to have knowledge in basic plant biology, including the taxonomy of plants, plant metamorphosis (life cycle), photosynthesis, and plant reproduction. The learners were also expected to have at least a “small” space for urban gardening, as well as willing to dedicate a portion of their time and their resources into urban gardening.

Sampling Procedure

Four participants were selected from each purok, except for Puroks 4 and 7, where three participants were chosen. Each respondent was selected by every ten doors. As of the latest Registry of Barangay Inhabitants declared that there were 16,894 inhabitants, with 4,582 households. Notably, the main source of livelihood in Batong Malake is the services sector. All population-related information through the RBI (Registry of Barangay Inhabitants) was published in 2020.

Figure 1. Paradigm of the Study



Data Gathering Procedure

A needs assessment pre-survey was conducted in a course of two weeks, from April 21 to May 4, 2024, in Barangay Batong Malake, Los Baños, Laguna, using printed questionnaires passed out to each potential respondent. Each questionnaire mostly contained multiple-choice questions for categories such as previous gardening experience, interest and motivation, and challenges and barriers to access to a gardening space. A modified 5-point Likert scale was utilized to gauge the respondents' familiarity

and interest towards certain topics related to urban gardening, with 1 showing the least familiarity or interest and 5 being the highest.

Data Analysis

Demographics of Pre-Survey Respondents

Most of the pre-survey respondents, or twenty-one individuals (73.33%) were female, while the remaining nine respondents (26.67%) were male. Seventeen (56.67%) of those who participated in the pre-survey had monthly incomes ranging from PHP0 to PHP 10,000. Six (20%) declared that they earned between PHP10,000 and PHP25,000 every month, while four (13.33%) earned between PHP25,000 and PHP50,000. One respondent had a monthly income of over PHP50,000 and another one said that they earn at least PHP100,000 monthly, while one participant refused to disclose his monthly income. Nine respondents owned businesses, such as *sari-sari* stores, *carinderias*, and grocery stores. Three participants were farmers, two participants were public servants, while four have already retired. One respondent was a “volunteer worker” at her church, one was a librarian, and another said that she was “self-employed” without further specifying her field or profession. Two participants were students, two were teachers, while three were unemployed. Yet another respondent refused to state his current occupation. The youngest respondent, a senior high school student, was 18 years old, while the oldest, a retired widow, was 75 years old. One respondent did not provide her age.

The median age of the respondents who provided their ages was 55 years old. Nine respondents (30%) stated that they completed high school, while another nine

respondents (30%) graduated with bachelors' degrees. Two (6.67%) participants finished only elementary school, while four (13.33%) received post-graduate degrees, including masteral and doctoral programs. Five (16.67%) took up TVET (technical and vocational education and training) programs. Eighteen (60%) of all respondents were married, eight (26.67%) were single, three were widowed, while one separated from their spouse. 76.67% of the respondents were Catholics, 13.33% were Born Again Christians, and 10% adhered to Iglesia ni Cristo.

Most respondents (56.67%) earned less than PHP10,000 per month, while 6 earned between PHP10,000 to PHP25,000. This implies that the proposed instructional material is indeed intended for the "less privileged" sector, particularly those who are interested in urban gardening, but do not have the sufficient financial and material resources to pursue it.

Nine (30%) participants were employed and had an average age of 50.39 years. 10 participants have completed a bachelor's degree in college while 9 finished high school; 5 even pursued vocational degrees. While most of these participants say that they want to start their own urban garden, many of them stated that they have barriers to face when starting these gardens, including temporal and financial constraints, insufficient land area, and concerns from their neighbors. Hence, the program's target learners shall be taught on how to maximize their small land space for an urban garden or start a container garden if they cannot plant on the ground. The survey revealed that 76.67% of respondents expressed interest in starting their own urban gardens, with 18 wanting a small space (less than 10 square meters), six wanting a medium space (10-100 square meters), and three wanting a large space (at least 100 square meters). In the past,

73.33% of respondents had some gardening experience, with 26 out of 30 planting various plants. The most common crops were eggplant, tomato, and *kangkong*, all of which are grown for food. A few other participants said that they have raised ornamental plants, such as bird-of-paradise; however, the cultivation of such plants was not discussed in *Seeds of Change*. Through constructive approaches in pedagogy, learners are expected to build upon previous gardening experiences and knowledge through novel, engaging hands-on gardening activities to build upon what they already know on farming.

Gardening Experience of Respondents

With the pre-survey respondents' overwhelming interest in starting urban gardens, there is a need for a collaborative, interactive element in cultivating food crops in the urban gardening program amid a small area for planting. For instance, community gardens highlight urban gardening as a form of socialization and the constructivist pedagogical approach reinforces learning as a collaborative activity as the learner constructs knowledge over their previous experiences.

Almost three-quarters of the respondents (73.33%) stated that they had some degree of experience in gardening, with the remainder declaring that they had no gardening experience. 26 out of 30 respondents have planted a variety of plants in the past, with eggplant, tomato, and kangkong as the most common crops. Eleven participants stated that they have planted tomatoes in the past, ten planted calamansi (a citrus fruit native to the Philippines), nine planted chilies, nine planted kangkong (water spinach), eight planted tomatoes, and four planted squashes. Six participants said that they have planted "ornamentals" including bird-of-paradise. In addition, at least ten

participants declared that they had once planted fruits, including rambutan, lanzones, marang, and durian. Lastly, there are three participants who stated that they have never planted any crops before.

Twelve respondents stated that they were familiar with organic farming, while nine respondents did not know any specific gardening practice. An overwhelming majority of respondents (76.67%) expressed their interest in starting their own urban gardens. 18 respondents wish to use a “small” space, which is defined in the survey as an outdoor plot of land less than 10 square meters in area, for their garden. Six wanted to start theirs using a “medium” space, or an outdoor land plot that measures between 10 to 100 square meters. Three respondents desired a “large” space, or an outdoor land plot with at least 100 square meters in area, for planting.

When the potential participants of the upcoming urban gardening education program already have some experience in farming and gardening, they will be able to easily grasp certain topics and skills that have been recently introduced to them. This manifests one of Mayer’s 12 Principles of Multimedia Learning, the “pre-training principle” (Gelisan & Mangubat, 2020). In this principle, connection to the learners’ prior knowledge or scaffolding, as well as introducing them to key concepts should be done before presenting the instructional materials to them, particularly when the topic that shall be discussed is novel or complex.

As most participants of the needs analysis stated that they are willing to plant an urban garden on a small plot of land, the content of the urban gardening education program shall be focused on cultivating food crops or produce in a small-scale gardening operation, particularly on an outdoor plot no more than 10 square meters in area.

Additionally, the program shall also provide resources on container gardening. According to UC Agriculture and Natural Resources (n.d.), container gardening, which involves the cultivation of plants in containers such as pots or similar vessels, is defined as an alternative gardening practice for individuals who cannot raise a traditional garden on the ground due to poor soil or insufficient space, allowing for a “flexible planting site” and the option of planting other species of plants every season.

Based on the survey, a majority of the participants reported that they wanted to start an urban garden using a small plot of land, which was defined in the survey as an outdoor plot of land whose area measures no more than 10 square meters. A majority of respondents declared that they wanted to establish their own urban garden.

Interest and Motivation of Respondents

To gauge the familiarity and interest of the pre-survey participants, a Likert scale was used, with a rating of 1 to denote a lack of “familiarity” or “interest” to 5 to denote a “very high” degree of familiarity or interest towards a certain topic or skill related to urban gardening. When it came to the familiarity of respondents with certain topics and skills related to urban gardening, thirteen (14.33%) of respondents said that they were “not familiarity at all” in basic plant biology, with 7 expressing a “slight familiarity”, 5 with a “moderate familiarity”, and the remaining 5 stating that they were either “familiarity” “very familiarity”. Most respondents declared that they were “familiar” with six topics, “not familiar” with seven other topics, and “slightly familiar” with two topics.

The respondents’ interests with urban gardening-related topics and skills greatly varied from their familiarity; in fact, most respondents declared that they were “interested” in learning these topics and skills. Notably, these participants had the most interest in

container gardening, rated with 5. Hence, it is said that the participants may have greater interest in gardening compared to familiarity, while some of those who are familiar with certain skills have less interest. Generally, however, most respondents stated that they had relatively lower familiarity than interest in urban gardening.

Most respondents stated that they were “not familiar” with topics such as *basic plant biology*, *crop selection*—choosing the best crops for the soil, climate, and other factors—and *crop rotation* or the practice of growing a sequence of different plants on the same location to improve soil fertility (Cherlinka, 2023), including the benefits of multicropping—planting a variety of crops in a single plot of land—as opposed to monocropping or planting exclusively one crop, as well as *marketing and sales*, *vertical farming*, *hydroponics*, and “*organic concoction* [sic] *and fertilizers*”. What these participants said that they were “familiar” with, however, include *transplanting*, *organic gardening practices*, *composting*, *harvesting and post-harvest handling*, and *food preservation*.

Additionally, these participants said that they were either “interested” or “very interested” in learning most topics, including *crop selection*, *soil preparation*, *transplanting*, *crop rotation*, *watering techniques*, *pest and disease management*, *organic gardening practices*, *composting*, *harvesting* and *post-harvest handling*, *food preservation*, *marketing and sales*, and “*organic concoction* [sic] *and fertilizers*”. However, they were “not [as] interested” in other topics, such as *vertical farming* and *hydroponics*.

Implementation

The *Seeds of Change* booklet is a comprehensive yet beginner-friendly guide for learners to ignite their interests hone and skills urban gardening, featuring eight topics: (1) **basic plant biology**, which refreshes readers on a plant's biological processes, such as photosynthesis, pollination, and fertilization, as well as essential plant nutrients; (2) **crop selection**, which discusses reasons to grow the right crops, sunlight requirements, multicropping, crop rotation, and a planting calendar for common crops; (3) **vertical and container gardening**, particularly its benefits and step-by-step guides for DIY planters; (4) **pest and disease management**, which lists common plant pests and diseases as well as prevention tips and a step-by-step guide for an all-natural pesticide; (5) **proper watering**, including watering times and efficient watering tips; (6) o**rganic concoctions and fertilizers**, which discusses different types of organic concoctions and an easy to follow procedure for making compost; (7) **hydroponics**, with a focus on the SNAP (Simple Nutrient Addition Program) system for its ease of use; and (8) **harvesting and marketing**, which details the right conditions for harvesting certain crops as well as proper storage, processing ideas to add value to crops, and marketing strategies for livelihood.

The pilot test of the *Seeds of Change* program was implemented on August 24, 2024, which also served as an evaluation day for learners. For the pilot test, 15 participants were identified using a list of names provided by an employee at the Barangay Hall. All of them resided in "Riverside", a low-income community by Molawin Creek, as it best represented the following characteristics of the target participants: low- to middle-income earners, or more specifically, those who earn less than ₱50,000 every year; permanent residents of Brgy. Batong Malake for at least three (3) years; and have

an interest in urban gardening, as well as access to a small space to grow their own gardens.

IV. RESULTS AND DISCUSSION

Sociodemographic Profile of Respondents

The residents of “Riverside” were selected as they best represented the following demographics of the program’s target learning audience: low- to middle-income earners, or more specifically, those who earn less than ₱50,000 every year; permanent residents of Brgy. Batong Malake for at least 3 years; and have an interest in urban gardening, as well as access to a small space of up to 10 square meters to grow their own gardens.

Based on the pre-survey respondents’ average familiarity and interest towards topics, the following topics were ultimately discussed in the booklet: (1) *basic plant biology*, (2) *crop selection*, (3) *vertical and container gardening*, (4) *pest and disease management*, (5) *proper watering*, (6) *organic concoctions and fertilizers*, (7) *hydroponics*, and (8) *harvesting and marketing*. Some of these topics were merged, particularly if they were closely related to each other, such as *vertical and container gardening* (from *vertical gardening* and *container gardening*), while others deemed irrelevant were omitted.

Implementation and Evaluation

Expert Review

For the expert review, CAFS associate professor Dr. Sheryl Iballa was tapped to evaluate the Seeds of Change booklet, as suggested by the author's external advisor or

gatekeeper. Dr. Iballa noted a plethora of deficiencies, detailed in her comments on the PDF file of the booklet. The booklet did not achieve two of the desired learning objectives: appraise methods of urban gardening based on viability in various settings and produce a small-scale urban garden. Moreover, she noted several inconsistencies on the usage of the terms "urban gardening" and "urban farming", as well as subtopics in the booklet's table of contents and the subheadings of each topic. She also saw the need of captions for some images for added context, as well as the need additional explanations for common plant pests and diseases and detailed step-by-procedures of learning activities with appropriate images. Additionally, she suggested that some key words be highlighted whenever they are introduced and defined in the booklet.

Pre-Test and Post-Test

On August 24, 2024, the "evaluation day for learners" took place. Prior to this, an ocular inspection of the site where the evaluation day was held, took place in "Riverside", a residential area near Molawin Creek, which best represented the target learner demographics of the booklet: low- to middle-income (annual income below PHP50,000.00), has some interest in urban gardening, and at least a small space for planting a garden.

As the participants gathered in one place, under a simple, tent-like structure outside their neighborhood, each received one booklet. These participants read the booklets in less than one hour, wherein they acquired useful information on urban gardening, aligning with the principles of the constructivist learning theory, which assumes that learning is an active process of constructing new knowledge from previous experiences, driven by social interaction and motivation (Kurt, 2021).

15 residents of the "Riverside" area took part in this evaluation day. Before and after the distribution of the booklets, which were printed in a copy shop in Los Baños, the residents were given pre-tests and post-tests, respectively, to measure their knowledge and understanding of the topics that were to be presented in the booklet. The results of the post-test compared to the pre-test were somewhat surprising, with some receiving lower scores, highlighting a limitation of the study, in which the instructional materials were published in English. Not all residents had a sufficient understanding in the English language; the media reviewer pointed that out when she evaluated the booklet with Evaluation Form A. An expert reviewer had already recommended the translation of the instructional materials to Filipino or Tagalog prior to distribution, although such translation was not performed due to time constraints.

While the implementation took place for only one day, the implementation of this project's pilot test was still momentous and insightful, with the participants finding value in the booklets distributed to them. Afterwards, the respondents each received a small envelope filled with three types of seeds: okra, pechay, and mustasa; these incentives motivated participants to start their own urban gardens to grow their own food, reinforcing a principle of the constructivist learning theory, thereby saving money, promoting environmental stewardship, and alleviating food insecurity.

Learner Perception

For Evaluation Form C, which was provided to the learners right after the post-test (Evaluation Form B), a form with eight questions related to instruction design and five questions on overall content evaluation was administered. The first part, which focused on the instructional design aspect, was a modified 4-point Likert scale—1 being the lowest

and 4 being the highest—that analyzed the booklet based on the following areas: (ID1) *clear, understandable language*; (ID2) *contribution to knowledge and skills in urban gardening*; (ID3) r*elevance and applicability of topics discussed*; (ID4) *ease of use and navigation*; (ID5) *logic and organization of content*; (ID6) *visual design*, i.e. typography, color, contrast; (ID7) *alignment of graphics with the topics being discussed*; (ID8) *absence of factual and typographical errors*. No "neutral" option was included in the Likert scale as it could mask the respondents' true opinions.

86.67% (13) of learners who read the booklet either “agreed” or “strongly agreed” that the language used there was clear and understandable. 93.33% (14), on the other hand, positively “agreed” that the booklet contributed to their knowledge and skills in urban gardening, discussed "relevant and applicable" topics and skills, was deemed easy to navigate and use, was organized in a logical manner. Moreover, 13 learners also had a positive perception with the appropriateness of the images and illustrations used in the booklet, as well as the absence of factual inaccuracies and typographical errors.

The second category of the learner perception evaluation, consisted of topics that the participants enjoyed the most, as well as their ratings of the booklet and their likelihood of recommending it to others. All 15 participants have stated that they are **positively likely** to recommend the booklet to other people, a stark contrast to the results of their post-tests.

According to most participants on evaluation day, which also served as the implementation of the Seeds of Change booklets, the most "well-liked" topic was Basic Plant Biology, with 11 participants considering it as one of their most well-liked topics. Their least "well-liked" topic, on the other hand, was Pest and Disease Management, with

four respondents appreciating it the least. However, no comments or suggestions were given as to why these topics were either "most liked" or "least liked".

Tables and Figures

Table 1.

Gender of Pre-Survey Respondents

Gender	Value and Percentage
Female	21 (73.33%)
Male	9 (26.67%)

Table 2

Monthly Incomes of Pre-Survey Participants

Income (Monthly, PHP)	Value and Percentage
< PHP10,000	17 (56.67%)
PHP10,000 - PHP25,000	6 (20%)
PHP25,000 - PHP50,000	4 (13.33%)
PHP50,000 - PHP100,000	1 (3.33%)
> PHP100,000	1 (3.33%)

Table 3

Age Range of Pre-Survey Participants

Age Range	Value and Percentage
18 - 19	1 (3.3%)
20 - 29	2 (6.7%)

Table 3 continued…

Age Range	Value and Percentage
30 - 39	5 (16.7%)
40 - 49	3 (10%)
50 - 59	9 (30%)
60 - 69	4 (13.3%)
> 70	5 (16.7%)
Not provided	1 (3.3%)

Table 4

Educational Attainment of Pre-Survey Participants

Educational Attainment	Value and Percentage
Elementary level	2 (6.7%)
High-school level	9 (30%)
Bachelor's degree	10 (33.3%)
Post-graduate level	4 (13.3%)
Vocational	5 (16.7%)

Table 5a

Preliminary Topics Based on Familiarity and Interest

Topic	Familiarity	Interest
Crop Rotation	1.84	1.83
Hydroponics	1.98	1.86
Pest and Disease Management	2.12	2.01
Crop Selection	2.17	2.06
Basic Plant Biology	2.29	2.18
Vertical Farming	2.34	2.24
Watering Techniques	2.25	2.26
Harvesting and Post-Harvest Handling	2.53	2.45

Table 5a continued…

Topic	Familiarity	Interest
Marketing and Sales	2.64	2.51
Organic concoction & fertilizers	2.63	2.55
Soil Preparation	2.76	2.68
Transplanting	2.86	2.79
Container Gardening	2.95	2.83
Organic Gardening Practices	2.98	2.92
Food Preservation	3.05	2.99
Composting	3.23	3.19

Table 5b

Ranges of Familiarity and Interest

Level of Familiarity/Interest	Range Points
Not familiar/interested at all	1-1.79
Slightly familiar/interested	1.8-2.59
Moderately familiar/interested	2.6-3.39
Familiar/interested	3.4-4.19
Very familiar/interested	4.2-5

Table 6.

Finalized Urban Gardening Topics for the Booklet

Topic	Sub-topics covered
Basic Plant Biology	It all starts with a seed: water, air, and the right temperature are necessary for germination What is photosynthesis? Essential nutrients for plants, i.e. nitrogen, phosphorus, potassium The process of bearing fruit: pollination and fertilization
Crop Selection	Reasons to grow the right crops

Table 6 continued…

Topic	Sub-topics covered
	Sunlight requirements Selecting plants based on usage, e.g. leafy vegetables and medicinals Planting calendar of common crops: weather patterns and optimal growing conditions Why multicropping? Benefits of crop rotation: healthy soil, reduce pests, etc.
Vertical & Container Gardening	Benefits of vertical farming (5A's): availability, accessibility, adequacy, awareness, aesthetics What is container gardening? Easy-to-make recycled PET planter DIY vertical planter: instructions with accompanying images
Pest & Disease Management	Common plant pests: aphids, eggplant shoot-and-fruit borer, fruit fly, rodents Common plant diseases: root rot, powdery mildew, black spot fungus Preventing pests and diseases: removing dead plant parts, sufficient water, routine pruning DIY garlic-onion-chili spray
Proper Watering	Best watering times: early morning, late afternoon Soil types: fast-draining vs clay Efficient watering tips: collecting rainwater or dish water, catch plates to prevent plant rot
Organic Concoctions & Fertilizers	Types of organic concoctions: fermented plant juice (FPJ), fermented fruit juice (FFJ), and vermitea Step-by-step instructions for making compost at home
Hydroponics	Best watering times: early morning, late afternoon Soil types: fast-draining vs clay Efficient watering tips: collecting rainwater or dish water, catch plates to prevent plant rot
Harvesting & Marketing	Harvesting at the right time Storage conditions Processing ideas Marketing ideas

Figure 1.

Paradigm of the Study

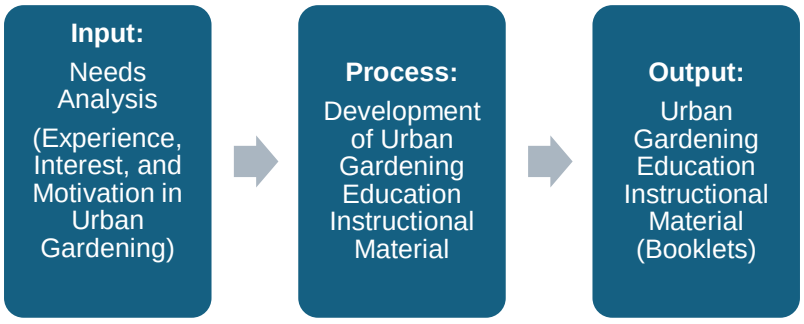


Figure 2.

Cover of the "Seeds of Change" booklet

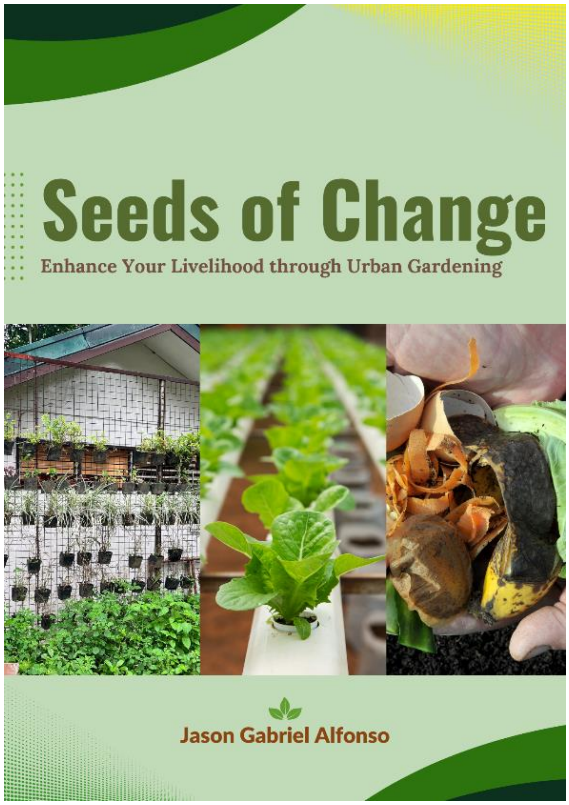


Figure 3.

Comparison Between Average Familiarity and Average Interest

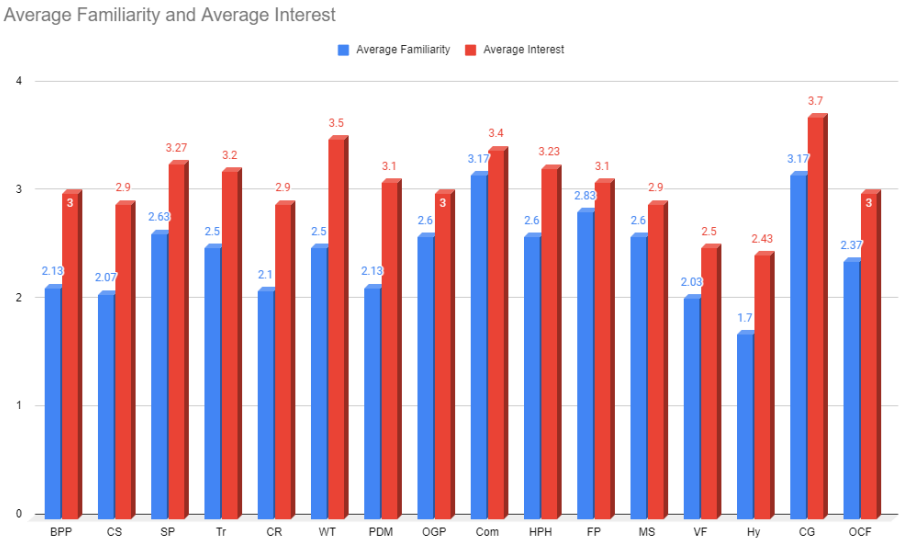


Figure 4.

Learner Perception of the Instructional Materials

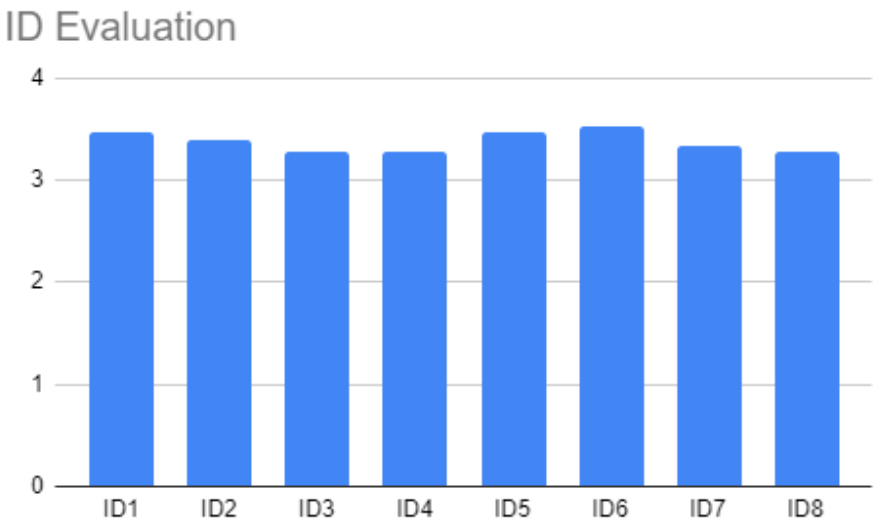
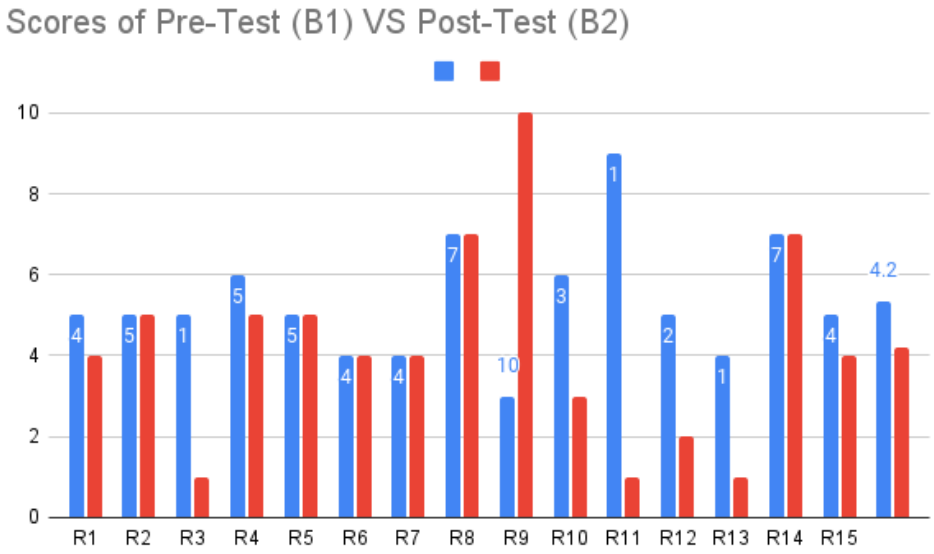


Figure 5.

Differences Between Pre-Test and Post-Test Results



V. SUMMARY, CONCLUSION, AND RECOMMENDATIONS

Summary and Conclusions

The practice of urban gardening involves planting food and non-food crops in urban settings, such as in community gardens, rooftop gardens, and indoor gardens (Akers, 2023). Urban gardening aims to solve food insecurity, promote environmental stewardship, encourage socialization, and improve the overall quality of life, particularly in marginalized communities where fresh produce remains inaccessible to the masses (Appetite for Change, 2022).

"Seeds of Change" was an urban gardening program intended for underprivileged residents of Barangay Batong Malake, Los Baños, Laguna. Despite its proximity to the University of the Philippines Los Baños, a "Center of Excellence" in agriculture education, many residents did not have sufficient resources for urban, nor did they have the finances to acquire such resources, despite having interest in urban gardening.

A needs assessment in the form of pre-survey forms was distributed to determine the which urban gardening topics were deemed either "familiar" or "interesting". Ultimately, eight topics were selected: (1) *basic plant biology*, (2) *crop selection*, (3) *vertical and container gardening*, (4) *pest and disease management*, (5) *proper watering*, (6) *organic concoctions and fertilizers*, (7) *hydroponics*, and (8) *harvesting and marketing*.

Initially, a series of seminars on urban gardening was planned, leveraging the hands-on nature of most of the topics covered in urban gardening. However, due to time constraints, only a booklet was developed, consisting of 28 pages beginner-friendly urban gardening information and learning activities. The booklet was printed in English, raising

a limitation in which not all readers or learners from the targeted learning audience - low- to middle-income residents - can understand the language, manifested on the day of evaluation.

Despite all challenges and limitations faced through the topic, as well as financial and temporal constraints surrounding the project's implementation, the *Seeds of Change* program was generally successful, in achieving most, if not all, of the learning objectives, particularly recall basic urban gardening knowledge and skills, the acknowledgement of the role of urban gardening in sustainable development, and the identification of urban gardening methods.

Recommendations

Translating Instructional Materials to Mother Tongue

A media expert who thoroughly reviewed the booklets advised translating the outputs, as well as the learner evaluation tools, to Filipino or Tagalog as some learners are not proficient in, let alone read or write, the English language. Hence, it is imperative to translate instructional materials to the language/s already familiar to the target audience to ensure their effectiveness.

Incorporating Collaborative Activities Aligned to Set Learning Objectives

The constructivist learning theory posits that learners actively acquire new knowledge from previous experiences. Moreover, an expert review detailed the need incorporate concrete instructional activities that align with the learning objectives. For instance, target learners may create a gardening diary or start a garden with their family and friends for collaboration. Additionally, some additional approaches to urban

gardening could also be incorporated to the learning content of the booklets, allowing learners to determine which urban gardening methods and types are suitable to their needs and their environment.

Using a Combination of Projected and Non-Projected Materials

Initially, a seminar series with projected slides and a resource speaker was initially planned for this project to leverage the "hands-on" nature of the subject matter as learners are expected to grow their own gardens; however, time constraints prevented its realization. Audio-visual aids, which help simulate learning, must be designed to align with appropriate learning outcomes, promote effective communication, and enhance students' retention of the teaching and learning materials in their minds. The use of audio-visual materials, whether projected or non-projected, may help cater to learners' different learning styles, whether visual, auditory, reading-and-writing learning, or kinesthetic learning. For instance, projected slides or videos are ideal for visual learners, while auditory learners learn best from hearing spoken lectures.

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Appendices

APPENDIX A: Needs Assessment Pre-Survey Form

URBAN GARDENING NEEDS ASSESSMENT SURVEY

Good day! I am Jason Gabriel C. Alfonso, a Bachelor of Education Studies student at the University of the Philippines-Open University. This survey aims to gauge the awareness and willingness of Barangay Batong Malake residents in urban gardening, in preparation for the design of an urban gardening course.

All the information provided in this survey shall be treated with the strictest confidentiality and will be solely used for the purpose of this study. If you have any concerns about privacy or data usage, kindly contact me at jcalfonso1@up.edu.ph. Thank you!

☐ **I agree to participate in this survey, and I hereby certify that all information provided herein is complete and accurate to the best of my knowledge, and that information shall solely be used for the purpose of the study.**

Date (MM/DD/YYYY): __ / __ / ____

Instructions: Make sure to honestly answer ALL questions in the survey. Thank you!

1. **Personal Information**

Name (First Name, Middle Initial, Last Name):

_____

_____

Age: ___

Address (House/Bldg. No., Street, Barangay, Town, Province):

_____

_____

Contact Number:

_____

Gender:

- ☐ Male
- ☐ Female
- ☐ Other: _____

Monthly Income Level (PHP):

- ☐ 0 to 10,000
- ☐ 10,000 to 25,000
- ☐ 25,000 to 50,000
- ☐ 50,000 to 100,000
- ☐ More than 100,000

Marital Status:

- ☐ Single
- ☐ Married
- ☐ Widowed
- ☐ Separated

Educational Attainment:

- ☐ Basic education
- ☐ Elementary level
- ☐ High school level
- ☐ Bachelor's degree
- ☐ Post-graduate level
- ☐ Vocational

Religious Affiliation:

- ☐ Catholic
- ☐ Protestant
- ☐ INC
- ☐ Born Again
- ☐ Muslim
- ☐ Other: _____

Occupation:

- ☐ Farmer
- ☐ Teacher
- ☐ Engineer
- ☐ Office worker
- ☐ Public servant
- ☐ Healthcare worker
- ☐ Artist or creative professional
- ☐ Salesperson
- ☐ Service worker
- ☐ Freelancer
- ☐ Student
- ☐ Unemployed
- ☐ Retired
- ☐ Other (please specify): _____

2. Gardening Experience

2.1. Do you have any experience in gardening?	☐ Yes ☐ No
2.2. Which plant/s have you planted before? Please check all that apply.	☐ Eggplant ☐ Squash ☐ Tomato ☐ Cabbage ☐ Carrot ☐ Kangkong ☐ Radish ☐ Singkamas ☐ Chili ☐ Banana ☐ Coconut ☐ Calamansi ☐ Gabi ☐ Camote ☐ Potato ☐ Cassava ☐ Rice ☐ Corn ☐ Others (please specify): _____
2.3. Which gardening methods are you already familiar with?	☐ Hydroponics ☐ Aquaponics ☐ Vertical farming ☐ Rooftop farming ☐ Organic farming ☐ Permaculture ☐ Integrated pest management

	▫ No specific method ▫ Others (please specify): _____

3. Interest and Motivation

3.1. Do you want to establish your own urban garden?	▫ Yes ▫ No
3.2. Why do you want to establish your own urban garden?	▫ Personal consumption ▫ Source of income ▫ Recreational activity ▫ Save money on produce ▫ Enhance the beauty of surroundings ▫ Enhance biodiversity in the community ▫ Educate others on farming ▫ Promote healthy eating habits ▫ Passion in farming ▫ Try new gardening techniques ▫ Others: _____
3.3 Given your space, how much land you willing to dedicate to your urban garden?	▫ Small outdoor plot (10 sq m or less) ▫ Medium outdoor plot (10 to 100 sq m) ▫ Large outdoor plot (more than 100 sq m) ▫ Container garden ▫ Indoor space (please specify): _____ ▫ Rooftop ▫ Others (please specify): _____

4. Urban Gardening Topics

4a. Familiarity

What topics and skills related to urban gardening are you already familiar with?

1 = not familiar, 2 = slightly familiar, 3 = moderately familiar, 4 = familiar, 5 = very familiar

Topic	1	2	3	4	5
Basic Plant Biology					
Crop Selection					
Soil Preparation					
Transplanting					
Crop Rotation					
Watering Techniques					
Pest and Disease Management					
Organic Gardening Practices					
Composting					
Harvesting and Post-Harvest Handling					
Food Preservation					
Marketing and Sales					
Vertical Farming					
Hydroponics					
Container Gardening					
Organic Concoction and Fertilizers					

4b. Interest

What topics and skills related to urban gardening are you interested in?

1 = not interested, 2 = slightly interested, 3 = moderately interested, 4 = interested, 5 = very interested

Topic	1	2	3	4	5
Basic Plant Biology					
Crop Selection					
Soil Preparation					
Transplanting					
Crop Rotation					
Watering Techniques					
Pest and Disease Management					
Organic Gardening Practices					
Composting					
Harvesting and Post-Harvest Handling					
Food Preservation					
Marketing and Sales					
Vertical Farming					
Hydroponics					
Container Gardening					
Organic Concoction and Fertilizers					

5. Challenges and Barriers

What potential challenges are keeping you from starting an urban farm?	◻ Lack of knowledge or information ◻ Lack of materials or resources ◻ Financial constraints ◻ Time management ◻ Limited space ◻ Difficult to find a space ◻ Pests and diseases ◻ Concerns from other residents ◻ Others (please specify): _____

6. Education and Support

6.1. Which instructional media do you prefer? Kindly check all that apply.	◻ Brochure ◻ Booklet ◻ Textbook ◻ Online course ◻ Videos or tutorials ◻ Podcast ◻ Broadcast media (radio or TV) ◻ Face-to-face events ◻ Others (please specify): _____
6.2. Why do you prefer so?	

Thank you for participating in this survey.

APPENDIX B: Informed Consent Form

INFORMED CONSENT FORM

I, _____, agree to participate in the instructional design project entitled *Seeds of Change: An Instructional Design for An Urban Gardening Education Program for Less Privileged Residents of Barangay Batong Malake, Los Baños, Laguna*, conducted by Jason Gabriel C. Alfonso, who has discussed the research project with me.

I consent to participate in the instructional design project and the following are the considerations for my participation:

- The research may not directly benefit me
- My participation is completely voluntary
- My right to withdraw from the study at any time without any implications to me
- The risks including any possible inconvenience, discomfort, or harm as a consequence of my participation in the instructional design project
- The steps that have been taken to minimize/mitigate any possible risks
- What I am expected and required to do
- Whom I should contact for any complaints with the research or the conduct of the research
- I am able to request a copy of the research findings and reports
- security and confidentiality of my personal information

In addition, I consent to:

- audio-visual recording of any part of or all research activities (if applicable)
- publication of results from this study on the condition that my identify will not be revealed.

If you have any questions, kindly contact Jason through his e-mail address (jcalfonso1@up.edu.ph).

Participant name: _____ (please print)

Participant signature:

_____

Date:

_____

APPENDIX C1: Evaluation Form A (Expert Review)

EVALUATION FORM A: EXPERT REVIEW

Good day! I am Jason Gabriel C. Alfonso, a graduating Bachelor of Education Studies student at the University of the Philippines-Open University, and my thesis is on an instructional design project known as “Seeds of Change”, a booklet intended to teach less privileged residents of Brgy Batong Malake, Los Baños, Laguna, on the basics and benefits of urban gardening, particularly vertical gardening and hydroponics, amid rising food costs. This evaluation form is intended to assess the fitness of the booklet for the said target learners based on its content, instructional design, and visual/technical design.

Target Learners:

The target learners are low- to middle-income (below PHP50,000.00) permanent residents of Brgy. Batong Malake, Los Baños, Laguna, for at least three (3) years, aged 18 to 60 years old, with an interest in urban gardening and access to a small space for urban farming.

Learning outcomes of the booklet:

At the end of this learning material the learners will be able to:

1. **Recall basic knowledge** and skills in urban gardening
2. **Explain the importance of urban gardening** in maintaining food security and promoting environmental protection.
3. **Identify various methods of and skills** in urban gardening, including hydroponics and vertical gardening.
4. **Appraise the aforementioned methods** of urban gardening based on their viability in various settings in an urban community.
5. **Produce a small-scale urban garden** with methods appropriate for the community to help enhance food security and protect the environment.

Part I. CONTENT

To what extent…

	0	1	2	3	N/A	References
Does the learning material on urban farming align with local perspectives?						
Is the content factually accurate?						
Is the content factually up-to-date?						
Is the scope and depth of the content appropriate for the cognitive and linguistic levels of the intended audience						
Does it align with the intended learning outcomes?						

***Legend**: 0 = Not at all, 1 = Slightly, 2 = Moderately, 3 = Extensively, N/A = Not applicable*

	0	1	2	3
Considering the above questions, how suitable is the content for dissemination for potential urban farmers?				
If the content is not suitable for dissemination for potential urban farmers? Please explain why, with specific references and examples.				
Additional comments, if needed				

Part II. INSTRUCTIONAL DESIGN

To what extent…

		1	2	3	4	N/A	References
Does the material effectively support both instruction and assessment?	Are the instructional goals and objectives clearly defined and consistently addressed?						
	Are the concepts clearly introduced, developed, and summarized?						
	Are the concepts clearly introduced?						
	Are the concepts clearly developed?						

	Are the concepts clearly summarized?						
Are technical terms clearly defined and appropriately introduced?							
Is the learning material adaptable to different learning and teaching styles?							
Does the learning material reflect a logical	Is the material well-organized, logically sequenced, and structured to support learning?						
	Do the learning material meet the intended goals and purpose?						

***Legend**: 0 = Not at all, 1 = Slightly, 2 = Moderately, 3 = Extensively, N/A = Not applicable*

	0	1	2	3
Considering the above questions, to what extent would the instructional design support student learning?				
If the instructional design is an obstacle to student learning, please explain why, with specific references and examples.				
Additional comments, if needed				

Part III. VISUAL/TECHNICAL DESIGN

To what extent…

		0	1	2	3	N/A	References
Does the visual presentation and layout effectively support learning?	Are illustrations clear, relevant, and strategically placed to enhance understanding?						
	Is the visual design interesting and engaging?						
	is the presentation logical, consistent and well-organized?						
	Are the font/s used appropriate for the intended audience?						
Are all components of the learning material organized in a clear, user-friendly manner?							

***Legend**: 0 = Not at all, 1 = Slightly, 2 = Moderately, 3 = Extensively, N/A = Not applicable*

	0	1	2	3
Considering the above questions, to what extent would the visual/technical design contribute to student learning?				
If the visual design is an obstacle to student learning, please explain why, with specific references and examples.				

Additional comments, if needed

EVALUATION DECISION

This material has been rejected in at least one of the following areas:

EVALUATION DECISION	Reject	
	YES	**NO**
I. CONTENT		
II. INSTRUCTIONAL DESIGN		
III. VISUAL/TECHNICAL DESIGN		

Reviewer's Name and Signature: _____

Date: _____

APPENDIX C2: Sample of Evaluation Form B (Pre-Test/Post-Test)

5/10

EVALUATION FORM B1: LEARNER PRE-TEST

Respondent No.: [redacted] Date: 08-24-24

Instructions: *Please use a ballpen to circle the letter that describes the best or correct answer.*

1. Which of the following is NOT a benefit of urban gardening?
a. Healthy and affordable food
(b) Discourage social interaction
c. Cleaner and healthier environment
(d) Create job opportunities

2. What do seeds need to germinate?
(a) Water
b. Air
(c) Right temperature
(d) All of the above

3. In the process of fertilization, the fruits form from which part of the flower?
a. Stigma
(b) Petal
(c) Ovary
d. Stamen

4. Which of the following is used by farmers to schedule their planting activities based on seasonal weather patterns and ideal growing conditions?
(a) Tractor
b. Greenhouse
(c) Irrigation system
(d) Planting calendar

5. Which container is the best to grow cucumbers or eggplants in a vertical gardening setup?
a. 1.5-liter bottle
(b) 5-gallon water container
(c) 10-gallon water container
d. 250mL bottle

6. Which of the following methods of pest control may be harmful to humans, animals, and even the soil?
a. Collecting and disposing of bugs and worms
b. Garlic-onion-chili spray
c. Picking leaves with disease
(d) Chemical pesticide

7. What are the best times to water your plants to prevent "thermal shock"?
(a) Early morning and late afternoon
b. Early morning and noontime
c. Evening only
(d) Noontime and late afternoon

8. Which of these organic concoctions is made by soaking vermicompost in water with diluted brown sugar?
(a) Fermented plant juice (FPJ)
(b) Vermitea
c. Fermented fruit juice (FFJ)
d. Witches' brew

9. Which of these is NOT a feature of SNAP Hydroponics?
(a) Relatively low-cost
b. Beginner-friendly
c. Can be used in small spaces
(d) Requires electricity to use

10. Which methods help market fresh produce effectively through urban farming?
a. Digital marketing
(b) Starting with family and friends
(c) Processing to add value
(d) All of the above

Thank you for your participation!

APPENDIX C3: Sample of Evaluation Form C (Learner Perception)

EVALUATION FORM C: LEARNER PERCEPTION

Respondent No.: [redacted] Date: 8, 24, 23

Part 1. Instructional Design Evaluation

Instruction: *Please use a ballpen to circle the number that best represents your perception for each statement. The scale is as follows:*

1 = Strongly Disagree | 2 = Disagree | 3 = Agree | 4 = Strongly Agree

The language used in the booklet was clear and understandable.	1	2	3	(4)
The booklet contributed to my knowledge and skills in urban gardening.	1	2	3	(4)
The topics and skills presented in the booklet were relevant and applicable.	1	2	(3)	4
The booklet was easy to navigate and use.	1	2	(3)	4
The content of the booklet was logical and organized.	1	2	3	(4)
The visual design of the booklet was appropriate (e.g., typography, color contrast).	1	2	3	(4)
The illustrations and images in the booklet aligned with the topics being discussed.	1	2	3	(4)
The booklet was free from factual inaccuracies and typographical errors.	1	2	3	(4)

Part 2. Overall Content Evaluation

1. **Overall, how would you rate this booklet?**
   A.Poor B. Fair C. Good D. Excellent

2. **Would you recommend this booklet to others?**
   A. Very Unlikely B. Unlikely C. Likely D. Very Likely

3. **Which top three (3) topics from the booklet did you <u>like the most</u>?**
   (Please check (✓) up to three)
   - ☑ Basic Plant Biology
   - ☐ Crop Selection
   - ☐ Vertical and container gardening
   - ☐ Pest and Disease Management
   - ☐ Watering Techniques
   - ☐ Organic Concoctions and Fertilizers
   - ☐ Hydroponics
   - ☐ Harvesting and Marketing
   - ☐ HAPAG Initiative

4. **Which top three (3) topics from the booklet did you <u>like the least</u>?**
   (Please check (✓) up to three)
   - ☑ Basic Plant Biology
   - ☐ Crop Selection
   - ☐ Vertical and container gardening
   - ☐ Pest and Disease Management
   - ☑ Watering Techniques
   - ☐ Organic Concoctions and Fertilizers
   - ☐ Hydroponics
   - ☐ Harvesting and Marketing
   - ☐ HAPAG Initiative

5. **Do you have any additional comments or suggestions for improving this booklet?** (If so, please provide them below.)

Thank you for your helpful evaluation. 😊