



Enhancing administrative literacy and bookkeeping management in urban farming as a contextual learning model for prospective elementary school teachers

Erni Suharini^{1*}, Ervando Tommy Al-Hanif¹, Edi Kurniawan¹, Satya Budi Nugraha¹, Nasir Nayan¹, Ferani Mulianingsih¹

^{1,2,3,4} Department of Geography, Faculty of Social and Political Sciences, Universitas Negeri Semarang, Indonesia

*Corresponding author: feranigeographer@mail.unnes.ac.id

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ABSTRACT

This research seeks to strengthen administrative literacy and bookkeeping management within urban farming as a form of contextual learning for future elementary school teachers. The project evolved from a community engagement initiative conducted in Sampangan Village, Semarang City, with the Women Farmers Group (*Kelompok Wanita Tani*) Puspitasari serving as a case model for promoting food security through urban agriculture. A participatory training method was applied, involving lectures, group discussions, practical demonstrations, and guided mentoring. Data were obtained through pre- and post-training questionnaires and analyzed using descriptive statistics alongside paired sample t-tests. The findings indicated a notable enhancement in participants' administrative and bookkeeping competencies, with the mean score rising from 65.15% (moderate) prior to the training to 82.70% (high) afterward. These results highlight that administrative literacy supported by systematic bookkeeping can function as an effective contextual learning framework for preservice elementary teachers by combining authentic problem-solving, environmental consciousness, and managerial abilities. Moreover, urban farming activities not only advance ecological awareness but also nurture critical thinking, collaboration, and entrepreneurial skills consistent with the *Merdeka Belajar* curriculum in primary teacher education. This approach presents a replicable model for teacher education programs seeking to integrate social, ecological, and managerial literacies into sustainable community-based learning. Furthermore, it offers practical guidance for embedding contextual, project-based experiences into preservice teacher curricula to strengthen professional readiness and community engagement.



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INTRODUCTION

Socio-ecological transformations driven by rapid urbanization and the degradation of green spaces in metropolitan areas have created serious challenges for food security and environmental sustainability (Ferani Mulianingsih, 2022; Foster, 2021; Heriza & Mulianingsih, 2023; Karagiannis & Magkos, 2020; Moghavvemi & Jam, 2025). Urban farming has emerged as a strategic solution to enhance food self-sufficiency by utilizing limited land resources within city environments (Fidiastuti & Sari, 2022; Meinusch et al., 2021; Salim et al., 2022). Beyond its economic and ecological relevance, this practice also holds significant pedagogical potential as a contextual learning source within the field of elementary education (Bousalis, 2021; Gunawan et al., 2020; Widowati et al., 2021). For prospective elementary school teachers, urban farming can serve as an authentic, community-based learning medium that integrates social, economic, environmental, and managerial knowledge into a cohesive educational experience.

In the context of elementary teacher education, administrative literacy and bookkeeping management skills represent crucial components of professional competence in the twenty-first century. Preservice teachers are not only required to master pedagogical theories and curriculum frameworks but also to acquire essential administrative, basic financial management, and organizational skills that support school programs and entrepreneurial activities. Administrative literacy fosters an understanding of systematic documentation, transparent reporting, and accountable resource management, while bookkeeping management enhances logical, analytical, and systematic thinking abilities. These competencies form part of the essential life skills emphasized in the *Merdeka Belajar* curriculum framework (Meylovvia & Julianto, 2014; Setiyaningsih & Subrata, 2023; Tia Nafaridah, Ahmad, Lisa Maulidia, Monry Fraick Nicky Gillian Ratumbusang, 2023).

A community engagement program conducted with the Women Farmers Group (*Kelompok Wanita Tani*) “Puspitasari” in Sampangan Village, Semarang City, demonstrated that urban farming can effectively enhance administrative literacy through the practical application of bookkeeping management in urban agriculture enterprises (Kintoko & Mulianingsih, 2022b, 2022a; Meliana et al., 2020; Naamati-Schneider & Alt, 2024; Purnomo & Mulianingsih, 2021; Shively & Palilonis, 2018). The training involved modules on harvest recording, cash inflow and outflow reporting, asset tracking, and the preparation of simple financial statements. Evaluation results revealed a significant improvement in participants’ administrative skills, increasing from a moderate category (65.15%) to a high category (82.70%) after the intervention. These findings suggest that urban farming not only strengthens community food security but also cultivates participants’ abilities in data management and evidence-based decision-making.

For elementary teacher education, these results provide empirical support that community-based initiatives such as urban farming can be adapted as a contextual learning model to foster multiple literacies social, ecological, and managerial in an integrated manner (Astuti et al., 2022; Haque et al., 2022; Hariyanto, 2021; Mulianingsih & Usman, 2025; Shafira & Mulianingsih, 2025; Sumarwati, 2022). This model enables preservice teachers to internalize project-based learning concepts that connect theoretical knowledge with real-world community practice. Accordingly, this study aims to explore how strengthening administrative literacy and bookkeeping management through urban farming can serve as an effective contextual learning model for preservice elementary teachers (Abdulhadi et al., 2023; Syah et al., 2021). The novelty of this research lies in the integration of administrative literacy, managerial competence, and environmental education as a sustainability-oriented pedagogical framework for teacher education curricula.

METHOD

1. Research Design

This study employed a descriptive quantitative approach using a quasi-experimental model, specifically the one-group pretest–posttest design (Creswell & Creswell, 2018; Kintoko, Dani Kusuma, Ferani Mulianingsih, 2024; Mulianingsih et al., 2023a, 2023b; Wahalathantri et al., 2018). This design was selected to measure the effectiveness of training aimed at improving administrative literacy and bookkeeping management within the context of urban farming as a form of contextual learning for prospective elementary school teachers. Such an approach aligns

with the characteristics of elementary education research, which emphasizes the application of experiential learning models that bridge theoretical understanding with authentic real-world contexts.

2. Research Location and Participants

The study was conducted in Sampangan Subdistrict, Gajahmungkur District, Semarang City, where the Puspitasari Women Farmers Group (*Kelompok Wanita Tani*) carries out ongoing urban farming activities. The participants consisted of 14 training attendees, comprising community representatives and pre-service elementary school teachers engaged in community-based learning activities. Their participation reflected a contextual learning process, in which teacher candidates acted as facilitators, observers, and active learners in social practice-based administrative literacy activities.

3. Research Procedure

The implementation of this study comprised four main stages:

a. Preparation Stage

The research team conducted preliminary observations to identify the administrative and bookkeeping needs of the Puspitasari Women Farmers Group. Training materials were developed based on the principles of administrative literacy and basic financial management, adjusted to the context of urban farming and the professional competencies expected of future elementary school teachers.

b. Training Implementation Stage

The training sessions combined interactive lectures, group discussions, question-and-answer sessions, and hands-on demonstrations. The material included: (1) concepts of administrative literacy; (2) recording of harvest transactions; (3) cash inflow and outflow reports; (4) asset and inventory documentation; and (5) preparation of simple financial statements. These activities were integrated into a Contextual Teaching and Learning (CTL) framework, allowing pre-service teachers to apply project-based learning principles through direct community mentoring and field practice.

c. Monitoring and Mentoring Stage

After the training, an intensive mentoring phase was conducted to ensure the systematic implementation of bookkeeping management. This stage involved periodic field visits and reflective sessions with participants and student facilitators to reinforce learning outcomes.

d. Evaluation and Reflection Stage

Evaluation was carried out by comparing pretest and posttest results using descriptive analysis and a paired sample t-test to measure improvements in administrative competence and bookkeeping ability. Additionally, qualitative reflection was employed to explore how the activity enhanced pre-service teachers' capacity to design community-based and socially entrepreneurial learning projects.

4. Instruments and Data Collection Techniques

Data were collected through the following instruments: (a) Closed-ended questionnaires to measure participants' levels of administrative literacy and bookkeeping ability before and after the training; (b) Observation sheets to assess participation, collaboration, and the application of CTL principles by pre-service teachers; (c) Semi-structured interviews with participants and students to gain contextual insights into learning experiences and the implementation of social entrepreneurship values.

5. Data Analysis Techniques

Data analysis was conducted in two phases:

a. Quantitative Analysis

Quantitative data were analyzed using descriptive statistics (mean, minimum, maximum, and achievement categories) and a paired sample t-test to determine the significance of improvement before and after the training. Results showed an increase in scores from 65.15% (moderate category) to 82.70% (high category) with a p-value < 0.05 , indicating a statistically significant improvement in participants' administrative literacy.

b. Qualitative Analysis

Qualitative analysis was performed on observation notes and reflective discussions to explore the interconnection between urban farming activities, contextual learning processes, and the development of pre-service teachers' social, ecological, and managerial competencies.

RESULTS

1. Enhancement of Administrative Literacy and Bookkeeping Management Competence

The training conducted for members of the Puspitasari Women Farmers Group (KWT) in Sampangan Village demonstrated a substantial improvement in participants' administrative literacy and bookkeeping management competencies. The pre- and post-training questionnaire results revealed that the average score for administrative and bookkeeping skills increased from 65.15% (moderate category) to 82.70% (high category). This improvement was statistically confirmed through a paired-sample t-test, which yielded a p-value of $0.000 < 0.05$, indicating a significant difference between participants' performance before and after the training. More specifically, the most notable improvements were observed in cash inflow and outflow recording, which rose from 74.65% to 85.70%, and in the quality of financial reporting, which increased from 65.41% to 83.25%. Meanwhile, participants' human resource competence in basic accounting also improved from 59.16% to 78.13%, signifying a meaningful enhancement of fundamental managerial abilities after the training and mentoring sessions.

These findings affirm that a hands-on and context-based approach to administrative and bookkeeping learning produces optimal outcomes by simultaneously strengthening participants' conceptual understanding and practical application skills. The results further emphasize the pedagogical value of contextualized experiential learning in fostering literacy relevant to professional administration and financial management.

2. Implementation of the Contextual Learning Model for Prospective Elementary School Teachers

Within the framework of elementary teacher education, urban farming serves as an effective Contextual Teaching and Learning (CTL) model that bridges theoretical administrative and management knowledge with authentic community practice. Prospective teachers actively engaged as facilitators, observers, and participants, enabling them to gain first-hand experiential learning through the following activities:

- a. Planning community administrative programs, including the preparation of financial documents, asset records, and activity reports;
- b. Analyzing bookkeeping outcomes and conducting social reflection, where students interpreted KWT's financial data to design sustainability strategies;
- c. Engaging in interdisciplinary learning, integrating social, economic, and environmental literacies consistent with the *Merdeka Belajar* philosophy.

Through this participatory process, preservice teachers developed administrative literacy, systematic thinking, and social competence essential for implementing Project-Based Learning (PjBL) at the elementary school level. The integration of managerial and ecological aspects within authentic learning contexts allowed students to transform community-based experiences into meaningful educational practices.

3. Impact on Strengthening the Professional Competence of Prospective Teachers

Student participation in the program demonstrated that contextual field experiences effectively enhance professional teacher competencies across three domains:

- a. Cognitive domain: strengthening understanding of basic financial management, administrative documentation, and principles of public accountability;
- b. Affective domain: cultivating empathy, social responsibility, and awareness of food security and environmental sustainability issues;
- c. Psychomotor domain: developing practical skills in simple financial recording, report preparation, and community project management.

Field observations revealed that participating preservice teachers exhibited improved ability to embed social and ecological values into instructional design for elementary education. This outcome aligns with Indonesia's *Merdeka Belajar* policy, which emphasizes 21st-century competencies such as collaboration, critical thinking, creativity, and social leadership.



Figure 1. Twenty-First-Century Skills in Urban Farming Education

4. Reflection and Implications for Elementary Education

The urban farming and administrative literacy training program proved to be a highly effective contextual learning medium for prospective elementary school teachers. Through this experience, they learned to:

- a. Recognize the importance of transparency and administrative accountability in school program management;
- b. Integrate environmental and social literacy into classroom learning activities;
- c. Design real-life thematic learning experiences relevant to students' local community contexts.

Therefore, this initiative can be recommended as a community-based contextual learning model adaptable to teacher education programs. It contributes to the strengthening of administrative, ecological, and managerial competencies among future educators, aligning with the holistic goals of sustainable and socially responsible elementary education.



Figure 2. Urban Farming as a Community-Based Contextual Learning Model

DISCUSSION

The findings of this study reveal a significant improvement in participants' administrative literacy, increasing from a moderate level (65.15%) to a high level (82.70%) following the training and mentoring sessions. This progression indicates that practice-oriented and context-based training activities effectively foster participants' understanding of administrative order, transparency, and accountability in managing community-based programs. In the context of elementary teacher education, these outcomes are aligned with the reinforcement of managerial and administrative competencies mandated by the *Merdeka Belajar* curriculum (Albareda-Tiana et al., 2024; Bousalis, 2021; Muhamad damiati, Nurasikin Junaedi, 2024; Sarnoto, 2024). Elementary school teachers are not solely instructional facilitators but also administrators responsible for class management, learning documentation, and school-based entrepreneurial projects. Consequently, mastering administrative literacy becomes a foundational competence for shaping prospective teachers who are systematic, accountable, and proficient in managing documentation, activity reports, and educational resources.

The implementation of urban farming within this program functioned as a contextual medium that bridges theoretical knowledge with authentic practice. Through activities such as harvest recording, cash inflow and outflow documentation, and preparation of simple financial statements, participants applied fundamental accounting principles directly. This process underscores the pedagogical importance of experiential learning and project-based learning (PjBL) approaches in cultivating 21st-century skills such as critical thinking, collaboration, and social responsibility (Ferani Mulianingsih, Andarweni Astuti, Amin Pujiati, 2025; Ferani Mulianingsih, Fajar, 2024; Lestari & Mulianingsih, 2025; Riyani et al., 2025; Yeni Suranti & Wahyuningsih, 2023).

For preservice elementary teachers, urban farming provides a meaningful avenue to understand interdisciplinary learning integrating concepts from science, economics, social studies, and environmental education into the real-life contexts of students. Thus, bookkeeping management is not merely a technical skill but also serves as an educational tool that strengthens numeracy, logical reasoning, and data-driven decision-making in teaching practice. Urban farming has demonstrated substantial ecological and social dimensions. The activities enhance participants' awareness of food security, environmental conservation, and women's empowerment, as exemplified through the Puspitasari Women Farmers Group. Within the realm of elementary education, embedding these socio-ecological values helps to cultivate future teachers who can promote sustainability oriented education in their classrooms. This approach resonates with the principles of Contextual Teaching and Learning (CTL), where authentic community experiences become integral sources of learning. By participating in these activities, preservice teachers learn to connect concepts of administrative literacy and resource management with broader social and environmental responsibilities at the local level.

The results of this study are consistent with Vygotsky's social constructivist theory, which emphasizes the critical role of social interaction and cultural context in knowledge construction (L. Dewi & Fauziati, 2021; Suoth et al., 2022). Through collaborative engagement with the Women Farmers Group (KWT), preservice teachers actively constructed administrative and financial knowledge rather than passively receiving information.

Furthermore, the findings reinforce Indonesia's *Profil Pelajar Pancasila* and the *Merdeka Belajar Kampus Merdeka (MBKM)* framework in elementary education. The program nurtured the six key dimensions of the learner's profile faith and devotion, independence, cooperation, critical reasoning, creativity, and global awareness through authentic, community-based learning experiences. Therefore, administrative literacy and urban farming bookkeeping management emerge as strategic tools in developing social, ecological, and managerial competencies among future elementary teachers. Academically, this study asserts that integrating administrative literacy training with community-based microfinance management constitutes an innovative approach to teacher education. This model can be adopted as a community-based contextual learning framework for elementary education institutions seeking to strengthen preservice teachers' managerial and socio-environmental literacy.

Practically, similar initiatives can be implemented within Field Practice Programs (PPL) or Community Service Learning (KKN) to enhance teacher candidates' capacity in managing school administration, entrepreneurial student projects, and environmentally oriented extracurricular programs. Such experiences encourage future educators to link classroom learning with real-world applications, thereby promoting holistic and sustainable educational practices.

CONCLUSION

This study demonstrates that the development of administrative literacy and bookkeeping management through urban farming activities is effective as a contextual learning model for prospective elementary school teachers, as evidenced by an increase in competence from a moderate level (65.15%) to a high level (82.70%). This learning approach, which emphasizes direct experience and socio-ecological practices, not only strengthens understanding of administrative accountability and transparency but also fosters essential 21st-century values such as collaboration, social awareness, and environmental consciousness. In line with the *Merdeka Belajar* philosophy that prioritizes authentic learning and the cultivation of multidimensional literacies, the integration of social, ecological, and managerial aspects within real-world contexts encourages preservice teachers to become more adaptive and reflective, while enhancing their ability to design thematic learning experiences that are closely connected to students' everyday lives. Consequently, this model has strong potential for broader adoption in teacher education programs oriented toward sustainable development.

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