

Aquaponic Blejo as Literacy and Numeracy Skills for Learning Communities

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Article Info	Abstract
Article history: Received: October 17, 2024 Accepted: January 10, 2025 Published: May 15, 2025 Keywords: Blejo aquaponics Learning community Literacy Numeracy skills This article is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License © 2025 Bubungan Tinggi: Jurnal Pengabdian Masyarakat	Aquaponic Blejo aims to provide hard skills related to fish and plant cultivation in buckets for the learning community at SMP Negeri 10 Lubuklinggau through the Blejo Aquaponic program. Aquaponic Blejo is a potential solution that needs to be developed. This technology protects the use of land and water. It enhances business efficiency by utilizing food waste and nutrients from fish metabolism to nourish water plants, offering an environmentally friendly fish farming system. Suitable plants for aquaponics include short-lived vegetables and fruits such as lettuce, spinach, mustard, tomatoes, cucumbers, and peppers. Fish species cultivated in aquaponics, such as tilapia, koi, carp, and other ornamental fish, do not require high oxygen levels. The method implemented in this training is service learning (SL), which includes Socialization, Aquaponic Blejo Training, and Student Understanding Tests through pre-tests and post-tests to measure students' understanding. The pre-test results showed a percentage of 25%, and the post-test showed a percentage of 95%. The difference in pre-test and post-test results indicates improved students' understanding after the training. In conclusion, the Blejo Aquaponic training for the SMP Negeri 10 Lubuklinggau learning community can enhance hard skills for SMP Negeri 10 Lubuklinggau students.
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INTRODUCTION

SMP Negeri 10 Lubuklinggau, also known as the "marginalized school," is located on the outskirts of Lubuklinggau City and has 20 teachers who hold additional positions. The school has only 210 students in grades 7 through 9, distributed across eight classes. Compared to schools in the city, the limited number of teachers and students is due to the school's location on the outskirts, its reputation as a "criminal and dangerous" area, limited school facilities, and low internet access. The availability of media and materials for teaching literacy is also limited, and the internal factors related to students, such as

80% of their parents not attending school, only having an elementary school education, and working in agriculture, have caused a lack of motivation. This situation has made teachers reluctant to work at SMP Negeri 10 Lubuklinggau, and parents have low trust in the school.

The limited school facilities have made teachers struggle to innovate in the teaching process and implement projects as part of the Merdeka Curriculum. Based on observations and interviews with the Head of SMP Negeri 10 Lubuklinggau, it was found that compared to the national assessment results in 2022 and 2023, there was a decline in literacy, with the root cause being the lack of innovation in teaching, which decreased by 15.30% from 2022. National rankings also showed SMP Negeri 10 Lubuklinggau in the lower ranks. Therefore, the school principal aims to foster teacher innovation by forming a learning community with 20 teachers to facilitate experience exchange, enhance professionalism, develop skills, provide motivation and support, and encourage collaboration.

However, the learning community has not yet motivated teachers to innovate due to the lack of management skills, such as unclear task distribution, responsibilities, and low discipline caused by a "comfort zone" mindset. Therefore, introducing the "Blejo Aquaponic" program is expected to improve the management of the Learning Community and enhance task distribution, authority, responsibility, and discipline, thus creating a more innovative learning community. The surrounding environment of SMP Negeri 10 Lubuklinggau has abundant natural resources, such as water and plants, which can be harnessed for educational innovation, particularly in implementing the "Blejo Aquaponic" project. This solution utilizes water and plant resources, offering a contextual medium for teaching literacy and integrating the roots of plants with fish waste, which can be absorbed as nutrients for the plants. Aquaponic is considered one of the alternative culture systems to improve the production and quality of leafy vegetables by combining soilless culture and fish farming. Utilization of fish manure contained in wastewater provides nutrient sources for growing plants ([Ramadhani et.al., 2020](#)). Aquaponics is a combination of aquaculture and hydroponic cultivation systems that can be a solution to overcoming limited land, limited water sources, and increasing food security (Rozie, et.al., 2021). Learning based on local wisdom affects the science process skills and local wisdom-based practicum method on science literacy skills and student learning outcomes ([Abdjul & Katili, 2021](#); [Sapitri, et.al., 2020](#)). Innovative learning with local wisdom creates an engaging learning environment and supports children's development by enriching experiences of local values and traditions. Innovative activities involve learning methods, creative management, material development, and local community empowerment ([Idhayani, et.al., 2023](#)).

The "Blejo Aquaponic" program at SMP Negeri 10 Lubuklinggau will also incorporate local wisdom from the community, specifically the local language called "Col," which students use as their "mother tongue." This approach aims to produce a bilingual pocketbook in Indonesian and "Col," which can help improve literacy skills and align with the Sustainable Development Goal (SDG) of quality education. The teacher's role in writing is to train students in creating a written work, as a facilitator by giving pleasure to students, and evaluating student work such as writing poetry, rhyming, and summarising activities ([Sihite, 2023](#)). SDGs programme, including in Indonesia, as an effort to improve and overcome the problem of education that is still unequal and can advance the welfare of society, one of which is to improving the quality of education ([Humaida et al., 2020](#); [Rulandari, 2021](#); [Safitri, et al., 2022](#); [Nurfatimah, et al., 2022](#)). Aquaponic Blejo aims to provide hard skills related to fish and plant cultivation in buckets for the learning community at SMP Negeri 10 Lubuklinggau through the Blejo Aquaponic program.

METHODS

The method implemented in the “Blejo Aquaponic” activity is based on Service Learning (SL), which consists of the following steps:

1. Initial Survey: Before the activity, an initial survey was conducted through observations and interviews with the school principal, Mrs. Nurliana, M.Pd.Mat and the learning community need to identify the problems and potential opportunities.
2. Socialization of the Activity: Before offering the solution, the team conducted a socialization session with the learning community about the “Blejo Aquaponic” program, which aims to enhance skills and produce more contextual media for teaching literacy. This session also served to gain support and cooperation from all members of the Learning Community at SMP Negeri 10 Lubuklinggau.
3. Defining the Target Audience: To achieve this activity's specific objectives, the target audience was determined to consist of 20 teachers from the learning community at SMP Negeri 10 Lubuklinggau.
4. Partner Participation: To successfully implement the Blejo Aquaponic project, partner participation is required, including:
 - a. Providing a location for the activity.
 - b. Actively participating in the process.
 - c. Providing space for the Aquaponic Blejo setup.
 - d. Designing a pocketbook of “Blejo Aquaponic” based on local wisdom in two languages (Indonesian and “Col”).
 - e. Establishing contact between the team and the SMP Negeri 10 Lubuklinggau learning community.
2. Implementation of the Activity: The implementation of the “Blejo Aquaponic” project involves two main stages:

Aquaponic Blejo Training with Vertimaponic Technology, the steps include:

- 1) Providing materials related to "Blejo Aquaponic," including definitions, benefits, advantages, disadvantages, and aquaponics design.
- 2) Offering training on aquaponic technology, including required materials such as vegetable seeds, water, and AB Mix, and tools such as racks, water tanks, aquarium pumps, PVC pipes, gutters, taps, nets, and rock wool.
- 3) Assembling aquaponic tools and preparing pots for seeds and plant nutrients.
- 4) Administering pre-tests and post-tests to assess the achievement of objectives, with results analyzed using the N-Gain formula.

Designing a Pocketbook of “Blejo Aquaponic” Based on Local Wisdom using Canva Technology, the steps include:

- 1) Providing knowledge about media, media types, the benefits of pocketbooks, and their pros and cons.
- 2) Collaborating with the learning community to design the "Blejo Aquaponic" pocketbook using Indonesian and "Col" languages based on local wisdom. The book is created using Canva.
- 3) Producing the final pocketbook as proof of achieving the targeted output.

Establishing Coordination between Groups: To ensure the success of the "Blejo Aquaponic" activity, a coordinator will oversee the process, be supported by the local government, and maintain communication with the target community. Evaluation will be conducted based on improvements between pre-test and post-test results.

RESULTS AND DISCUSSION

This activity began with the team conducting observations to identify the needs of the school, the issues, and potential solutions that could be offered. After the observations and interviews, the next step was to socialize the program with the learning community consisting of 20 teachers (Figure 1). After the socialization, the team administered a pre-test to assess the skill levels of the learning community at SMPN 10 Lubuklinggau. In the following meeting, the team provided introductory knowledge about aquaponics and demonstrated the skills to be applied during the activity.



Figure 1 Socialization of the "blejo aquaponics" activity

The next week, the team and technicians assembled the aquaponic system at the school using water spinach and pakcoy plants, along with catfish and tilapia (Figure 2). Additionally, the team and the learning community taught the students aquaponics skills using buckets, making them easy to maintain.



Figure 2 Assembly and preparation of seeds and fish

During the "Blejo Aquaponic" activity, in addition to being enthusiastic, the learning community's skills also showed significant improvement in the creation of "blejo aquaponics" (Figure 3).

Throughout the "Blejo Aquaponic" activity, there was a noticeable improvement in the learning community's skills through observations in material selection, the process of creation, and the final product. The skill level increased from 25% (initial skill level) to 95% (final skill level). All members of the learning community successfully created the "blejo aquaponics." The "banjo aquaponic" products made in training are highly scalable for future use, as they can be incorporated into the students' literacy and numeracy learning projects.

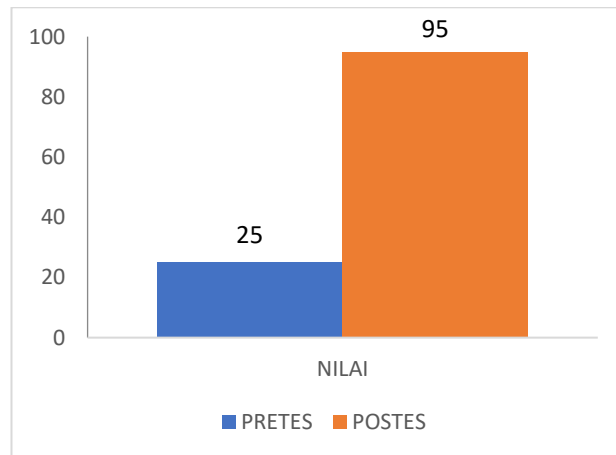


Figure 3 Skill levels of the learning community

The aquaponics system combines aquaculture and hydroponics, where fish farming waste is used as plant fertilizer ([Surur et al., 2021](#)). Aquaponic cultivation is a technology that combines fish farming with plant cultivation in one system that optimizes the use of water and space as a maintenance media. The basic principle of aquaponic farming is that fish food waste and excrement, which would otherwise degrade water quality, are absorbed and utilized by plants as nutrients. Fish waste and food remnants are a nutrient source for hydroponic plants grown above. These plants do not require additional fertilizers, as they receive nutrition from the water, which serves as the fish's habitat. The plant roots function as biofilters, absorbing the accumulated fish waste that would otherwise be toxic to the fish ([Yaqin et al., 2022](#)). This creates a mutually beneficial symbiotic relationship between the plants and the fish. Simple aquaponic systems can be made using locally available resources ([Waslah et al., 2022](#)). Innovations in low-cost aquaponics have been made using mineral water bottles and Styrofoam food containers ([Zulfikar et al., 2021](#)).

Based on the identified problems and the available natural potential, the offered solution is "Blejo Aquaponic," which involves providing training in aquaponics skills based on local wisdom and teaching the development of a bilingual pocketbook of "Blejo Aquaponic" in both Indonesian and the local "Col" language. This pocketbook serves as a media tool for teachers to enhance literacy education. Research on aquaponic skills and technology reveals that aquaponics can also serve as a supplemental income source and a means of improving the economy in communities such as Dusun III Sri Pengantin ([Lestari, 2021](#); [Lestari et al., 2023](#)).

Aquaponics technology, derived from aquaculture (fish farming) and hydroponics (soil-free plant cultivation), adopts ecological principles in natural environments. It involves a mutualistic relationship between fish and plants with several benefits, including reducing ammonia waste, doubling profits, energy and time efficiency, and aesthetic value ([Zidni et al., 2019](#); [Asni et al., 2020](#)).

CONCLUSION

Based on the implementation of the "Blejo Aquaponic" activity, the environment can serve as a source for literacy and numeracy education. Furthermore, the environment provides opportunities for creativity and innovation, utilizing available resources, including innovation with Blejo Aquaponic.

AUTHOR CONTRIBUTIONS STATEMENT

Conceptualization, FL; methodology, YF and N; Collecting data, S, MA, APM, RS, NA; Analysis data, GAW, RS; Editing, DSM and RA.

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