Dedicated: Journal of Community Services (Pengabdian kepada Masyarakat) - p-ISSN 2988-4179 & e-ISSN 2988-4187
Volume 4 No 1 (2026) 201-216

Dedicated:
Journal of Community Services
(Pengabdian kepada Masyarakat)
https://ejournal-education.upi.edu/dedicated

Waroeng Batja: Empowering village learning through digital literacy and social entrepreneurship

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ABSTRACT

Waroeng Batja was developed as a community-based informal school in Panguragan Lor Village. This program is designed as a free, open, and participatory learning space. Waroeng Batja has succeeded in establishing a community-based informal learning ecosystem involving 70 school-age participants, consisting of 23 elementary school students, 31 middle school students, and 16 high school students, and supported by 30 student facilitators. The program is implemented through Participatory Action Research (PAR), with routine learning activities held three times a week, including reading habits, assistance with school assignments, English learning, basic digital literacy, local cultural learning, and entrepreneurial practices. Quantitatively, the entrepreneurship program involves 45 students, using 400 oyster mushroom bags that produce 180 kg of harvest, and utilizing 80 m² of land for vegetable cultivation with a yield of 120 kg. The entrepreneurship component generated revenue of Rp6,160,000, a surplus of Rp1,860,000, social cash funds of Rp958,000, measurable social benefits of Rp4,773,000, and a simple social return on investment of 1.11. In terms of culture, the initial assessment showed that none of the 10 purposively selected participants could name at least 3 forms of Cirebon culture. In contrast, in the final assessment, all 10 participants were able to name at least three forms of Cirebon culture and were involved in practicing and performing the Cirebon Mask Dance. These findings indicate that informal schools that integrate literacy, culture, and social entrepreneurship can serve as a contextual model of community service when supported by the participation of facilitators, village government, and partner networks, and by data-based evaluation.

ARTICLE INFO

Article History:
Received: 1 Dec 2025
Revised: 29 Apr 2026
Accepted: 19 May 2026
Publish online: 10 Jun 2026

Keywords:
digital literacy; informal school; social entrepreneurship; social innovation; Waroeng Batja

Open access
Dedicated: Journal of Community Services (Pengabdian kepada Masyarakat) is a peer-reviewed open-access journal

ABSTRAK

Waroeng Batja dikembangkan sebagai sekolah informal berbasis komunitas di Desa Panguragan Lor. Program ini dirancang sebagai ruang belajar yang bebas, terbuka, dan partisipatif. Waroeng Batja berhasil membentuk ekosistem belajar informal berbasis masyarakat yang melibatkan 70 peserta usia sekolah, terdiri atas 23 siswa SD, 31 siswa SMP, dan 16 siswa SMA, serta didukung oleh 30 fasilitator mahasiswa. Program dilaksanakan melalui Participatory Action Research (PAR) dengan kegiatan belajar rutin tiga kali seminggu yang mencakup pembiasaan membaca, pendampingan tugas sekolah, pembelajaran bahasa Inggris, pendampingan literasi digital dasar, pembelajaran budaya lokal, serta praktik kewirausahaan. Secara kuantitatif, program kewirausahaan melibatkan 45 siswa, menggunakan 400 baglog jamur tiram yang menghasilkan 180 kg panen, serta memanfaatkan lahan 80 m² untuk budidaya sayuran dengan hasil 120 kg. Komponen kewirausahaan menghasilkan pendapatan sebesar Rp6.160.000, surplus Rp1.860.000, dana kas sosial Rp958.000, manfaat sosial terukur Rp4.773.000, serta nilai social return on investment sederhana sebesar 1,11. Pada aspek budaya, asesmen awal menunjukkan bahwa tidak satu pun dari 10 peserta yang dipilih secara purposif mampu menyebutkan sedikitnya tiga bentuk budaya khas Cirebon, sedangkan pada asesmen akhir seluruh 10 peserta mampu menyebutkan sedikitnya tiga bentuk budaya Cirebon serta terlibat dalam latihan dan penampilan Tari Topeng Cirebon. Temuan ini menunjukkan bahwa sekolah informal yang mengintegrasikan literasi, budaya, dan kewirausahaan sosial dapat menjadi model pengabdian masyarakat yang kontekstual apabila didukung oleh partisipasi fasilitator, pemerintah desa, jejaring mitra, serta evaluasi berbasis data.

Kata Kunci: *inovasi sosial; kewirausahaan sosial; literasi digital; sekolah informal; Waroeng Batja*

How to cite (APA 7)
Fadhila, W., & Putra, K. C. P. (2026). Waroeng Batja: Empowering village learning through digital literacy and social entrepreneurship. *Dedicated: Journal of Community Services (Pengabdian kepada Masyarakat), 4*(1), 201-216.

Peer review
This article has been peer-reviewed through the journal's standard double-blind peer review, where both the reviewers and authors are anonymised during review.

https://doi.org/10.17509/dedicated.v4i1.607

INTRODUCTION

Education plays a strategic role in improving the quality of human resources, particularly in rural areas that continue to face limited access to learning assistance. In the era of digital transformation, every individual is required to possess a certain level of digital literacy to use technology effectively, including understanding information, participating in learning at school, and adapting to changing learning environments (Nogueira et al., 2022; Sánchez-Cruzado et al., 2021). Digital literacy is also related to the ability to think critically, communicate, collaborate, solve problems, and use digital media productively (González-Pérez & Ramírez-Montoya, 2022; Pedaste et al., 2023). In addition, the increasingly digital demands of the world of work and entrepreneurship require individuals to develop digital skills from an early age to integrate learning processes, academic information-seeking, career opportunities, and technology-based productive activities (Reddy et al., 2023).

The urgency of digital literacy today is closely linked to changes in the learning ecosystem, which is becoming increasingly hybrid, open, and technology-based (Pedaste et al., 2023). At the same time, the development of learning platforms, social media, and generative artificial intelligence requires new competencies, such as assessing the credibility of information, using technology ethically, and independently reflecting on learning outcomes (Anttonen et al., 2023; Chiu et al., 2024). However, this readiness is not evenly distributed, particularly among individuals who have limited access to learning assistance, information, and family support when using technology for academic purposes. This condition indicates that community-based learning assistance remains necessary as a bridge between formal schools and learning needs within a digital environment (Nogueira et al., 2022).

Similar problems were found in Panguragan Lor Village, Panguragan District, Cirebon Regency, West Java. Based on preliminary observations and discussions with residents, some students had difficulty understanding school materials. Students need an additional learning space that can help them complete assignments, understand the subject matter, develop reading habits, and receive assistance closely aligned with their social conditions. On the other hand, students also need access to information regarding further education, scholarships, employment opportunities, and practical skills that can support their independence. Some students do not yet have a clear understanding of their options after graduating from school, whether related to further education, employment, internships, or productive economic activities. This condition needs to be addressed through social entrepreneurship mentoring, as social entrepreneurship interventions can strengthen self-worth and career competencies among vulnerable young people (Tam et al., 2021).

Limited information, skills, and social capital may also reduce adolescents' readiness to identify social entrepreneurship opportunities, as such readiness is related to formal and informal training, social capital, and the ability to recognize socio-economic opportunities (Zulfiqar et al., 2021). Therefore, entrepreneurship based on local potential is important because rural enterprises are not only determined by geographical location, but also by attachment to the community, utilization of local resources, creation of economic and social value, and support from the local entrepreneurial ecosystem (Candelario-Moreno & Sánchez-Hernández, 2024; Olmedo et al., 2023). Thus, social entrepreneurship can serve as a form of empowerment, as it is oriented toward economic benefits while also integrating skills-based learning, innovation, and social benefits for the community (Alzate et al., 2024; Azqueta et al., 2023; Ndou, 2021).

Waroeng Batja was developed as a community-based informal school in Panguragan Lor Village. This program was designed as a free, open, and participatory learning space. Its focus is not limited to academic assistance but also includes strengthening basic digital literacy, educational and career

https://doi.org/10.17509/dedicated.v4i1.607

counseling, English language learning, local cultural development, and entrepreneurship practices through the cultivation of oyster mushrooms and vegetables. Through this approach, Waroeng Batja can be understood as a social innovation that integrates education, technology, culture, facilitator networks, social entrepreneurship, and community empowerment. Previous community service studies have addressed digital literacy assistance, technology literacy training, SME digitalization, and student entrepreneurship programs across various community settings (Hakim & Nusantara, 2023; Hanifa et al., 2023; Nurgianti et al., 2023; Pisriwati et al., 2025). However, these studies tend to discuss literacy, technology use, or entrepreneurship assistance as relatively separate program components.

The novelty of this article lies in its integrated community service model, which combines basic digital literacy assistance, local cultural learning, and social entrepreneurship within a single informal, village-based school ecosystem. Unlike prior community-service studies that often examine literacy, culture, or entrepreneurship assistance separately, this article demonstrates how these components can be implemented together and evaluated through participant involvement, production outputs, financial records, social cash funds, and a simple Social Return on Investment calculation. This article aims to describe the implementation of Waroeng Batja as a model of an informal school grounded in digital literacy and social entrepreneurship, and to analyze its contribution to improving the quality of human resources in Panguragan Lor Village. Specifically, this article discusses three main dimensions: strengthening literacy and learning assistance, introducing local culture as a space for developing students' self-confidence, and promoting social entrepreneurship based on village potential.

Literature Review

Social Entrepreneurship

Social entrepreneurship in community service connects learning processes, production, processing, marketing, and social benefits. Social entrepreneurship education emphasizes the development of business orientation, as well as the ability to identify community needs, utilize local potential, and create sustainable social value (Azqueta et al., 2023; Ndou, 2021). There is a study on converting used cooking oil into aromatherapy candles, increasing students' interest in candle making from 50% to 88% and interest in entrepreneurship from 48% to 93%, while research shows that SME digitalization assistance improves participants' understanding of online product marketing and social media management (Hanifa et al., 2023; Pisriwati et al., 2025). Studies on social entrepreneurship and entrepreneurial self-efficacy show that learning linked to social issues can strengthen participants' orientation toward solving community problems and developing innovative ideas (Vázquez-Parra et al., 2023). In addition, social entrepreneurship operates through practices that negotiate economic and social values within communities (Chatterjee et al., 2021). However, it still needs to be positioned proportionally so as not to oversimplify structural problems that also require institutional support (Chalmers, 2021).

Digital Literacy

Digital literacy is the ability to operate technological devices, as well as to read, interpret, evaluate, and use digital information in continuously changing social contexts (Pangrazio et al., 2020). Basic digital literacy includes the ability to follow technology-based learning instructions, search for relevant learning resources, understand academic information, and use communication media for educational purposes (Nogueira et al., 2022; Wijayanti et al., 2024). These skills also include technical proficiency, information management, communication, collaboration, critical thinking, creativity, and technology-supported

https://doi.org/10.17509/dedicated.v4i1.607

problem solving (Van Laar et al., 2020; Zhao et al., 2021). Since digital information is not always valid, students need to be trained to assess source credibility, compare information, and use online resources responsibly (Anttonen et al., 2023; McGrew, 2020). Thus, basic digital literacy in community programs should be understood not only as a technical skill but also as the ability to learn, think critically, and participate safely in the digital information ecosystem. Strengthening digital literacy can be implemented through socialization, mentoring, and the development of digital learning media that involve students, parents, and teachers (Hakim & Nusantara, 2023). Technology literacy for school-age children also indicates that direct practice with laptops, word-processing applications, and internet browsing can improve children's basic ability to operate digital devices for learning purposes (Nurgianti et al., 2023).

Community-Based Learning

Community-based learning becomes important when families and formal schools are not yet fully able to provide adequate assistance. Communities can provide learning spaces that are flexible, close to participants, and responsive to local needs. Furthermore, locally based culture education can help shape students' identities, meaningful learning experiences, and self-confidence. Students' involvement in dance practice, martial arts, and public performances provides social experiences that position participants not merely as recipients of cultural information, but also as actors who experience, practice, and present local heritage (Vázquez-Parra et al., 2023). This process is relevant to arts and culture-based learning because cultural experiences can strengthen participants' understanding of their social environment. In self-efficacy theory, mastery experiences are among the key sources shaping individuals' beliefs in their own abilities.

METHODS

Program Design

This community service activity employed a Participatory Action Research (PAR) method. This method was selected because Waroeng Batja was not designed as a program entirely developed by facilitators, but rather as a community-based learning movement involving residents, the village government, facilitators, students, parents, and local partners. PAR emphasizes collaborative inquiry, community participation, action, and reflection in addressing real social problems. In the PAR method, the community is positioned as a subject that participates in identifying problems, formulating actions, implementing programs, observing changes, and reflecting on the results of activities. The implementation framework refers to the cycle proposed by Kemmis et al. in the book "*The action research planner: Doing critical participatory action research* ", which consists of planning, action, observation, and reflection. The PAR approach is relevant because the community's problems are not only related to low literacy levels or limited learning assistance but also to participation, trust, collaboration, and program sustainability.

Thus, this community service activity functions not merely as a one-way transfer of knowledge but also develops as a shared learning process among facilitators, students, families, the village government, and partners. The activity was carried out in Panguragan Lor Village, Panguragan District, Cirebon Regency, West Java. The program targeted elementary, junior high, and senior high school students engaged in social, cultural, and entrepreneurial activities. During the implementation stage, the program involved 70 participants, consisting of 23 elementary school students, 31 junior high school students, and 16 senior high school students, supported by 30 student facilitators from various universities, including two student facilitators from the University of Arkansas. The parties involved in the program included the Panguragan Lor Village Government, students' parents, student facilitators, local communities, Karang Taruna, and

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partner networks. The two University of Arkansas facilitators joined through direct site visits to Panguragan Lor Village. They contributed to English-language learning activities, particularly listening and speaking practice with participants at Waroeng Batja.

The involvement of these actors strengthened Waroeng Batja's position as a community service program grounded in cross-community collaboration. Program socialization and participant recruitment were conducted through coordination with the Panguragan Lor Village Government, local community representatives, parents, and youth organizations. Information about the program was shared through village-level communication, informal meetings, and direct communication with families. Participants were not selected through random sampling; instead, they joined voluntarily based on their interest, learning needs, availability, and parental or guardian approval. The target participants were school-age children living in or around Panguragan Lor Village, particularly elementary, junior high, and senior high school students who needed additional learning assistance and were interested in cultural and entrepreneurship activities.

Student facilitators were recruited through the organizers' university and community networks. The main criteria for facilitators included willingness to participate, commitment to regular mentoring schedules, ability to assist school-age children, and readiness to participate in weekly reflection and evaluation meetings. Because the program involved children and adolescents, parental or guardian consent was obtained before participants joined the activities. No formal institutional ethical clearance was required because the activity was implemented as a community service program and did not involve clinical, experimental, or high-risk procedures. Nevertheless, ethical principles were maintained by ensuring informed consent, voluntary participation, anonymity, confidentiality, respect for participants, child protection, protection of participants' identities in documentation and reporting, and the use of interview and observation data only for program evaluation and academic reporting.

Program Stages

The planning stage was conducted through problem mapping with residents and the Panguragan Lor Village Government. The mapping process was carried out through dialogues with the village head, community members, prospective participants, parents, and facilitators. At this stage, several main problems were identified, namely a low reading culture, students' difficulties in understanding school materials and assignments during online learning, limited access to free learning spaces, low exposure to local Cirebon culture, and suboptimal development of entrepreneurial skills among students.

The action stage involved implementing the program based on the results of the needs mapping. The main activities were conducted regularly on Fridays, Saturdays, and Sundays from midday to late afternoon. Participants were grouped by educational level so that the materials and mentoring methods could be tailored to each group's learning needs. The educational program included teaching and learning activities, discussion of school materials, homework assistance, reading aloud, English-language learning, and educational and career counseling. The digital literacy program was implemented through assistance with online school assignments, information-seeking related to education and careers, and the use of communication media for coordination, as well as social media platforms such as Instagram, Facebook, and WhatsApp. The entrepreneurship program was implemented by cultivating oyster mushrooms and vegetables.

Facilitators first conducted a comparative study with mushroom farmers, and the knowledge gained was then applied in practical activities with participants. Students were introduced to the processes of production, maintenance, harvesting, product processing, packaging, and value-added development.

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Vegetable cultivation was carried out using available spaces around the village, linking entrepreneurial activities to environmental use and social benefits for residents. The observation stage was conducted throughout the program to examine students' responses, community involvement, implementation challenges, and program outputs. Program managers and facilitators conducted direct observations of participant attendance, active engagement in learning activities, ability to follow instructions, responses to reading and English activities, interest in cultural activities, and participation in entrepreneurship practices.

The reflection stage was conducted through internal discussions among program managers and facilitators after the activities. Reflection aimed to assess the suitability of the program to students' needs, identify implementation barriers, and formulate improvement plans. Reflection was conducted through weekly activity evaluations, discussions on the learning materials most needed by students, adjustments to the informal curriculum, division of facilitator tasks, and identification of partnership needs.

Data Collection

Data were collected through participatory observation, informal interviews, activity documentation, records of participant and facilitator counts, and production and financial records from entrepreneurship activities. Informal interviews were conducted periodically throughout the program, rather than on a single day. Interviews were conducted when informants were available, for example, when parents picked up their children after learning activities or when student participants and facilitators had free time between program activities. The informants consisted of five parents of participants, 20 student participants consisting of 10 junior high school students and 10 senior high school students, three cultural facilitators, and 15 general facilitators. Elementary school students were observed during the activities. However, they were not included in the informal interview group because the questions required reflective responses that were better suited to junior and senior high school participants.

The interviews were conducted on-site at Waroeng Batja after learning, cultural, or entrepreneurship activities. Each interview lasted approximately 10-15 minutes and was conducted in an informal conversational format to maintain informant comfort. The interviews were not audio-recorded; instead, the program team recorded the main points as narrative field notes. The interviews were guided by several recurring topics, including participants' learning experiences, perceived behavioral changes, perceptions of local culture, and experiences in entrepreneurship activities. The quotations presented in the Results section were selected because they represented recurring themes identified in the interview notes. The identities of informants were anonymized to maintain ethical standards in activity reporting. Activity documentation was used to trace program forms, participant involvement, cultural activities, social activities, and entrepreneurship practices.

Data analysis was conducted using descriptive qualitative analysis and simple quantitative analysis. The qualitative data were analyzed using a deductive-inductive thematic approach, in which initial categories were derived from the program components and then enriched with inductive codes emerging from interview notes, facilitator field notes, participatory observations, and activity documentation. The deductive categories included literacy and learning assistance, basic digital literacy, local culture, social entrepreneurship, social activities, and collaborative networks. The inductive codes included students' growing confidence, changes in learning habits at home, facilitator commitment, parental trust, adjustments to learning materials, and the distribution of roles among facilitators. Data that did not directly fit the initial categories were discussed in weekly reflection meetings and treated as contextual findings related to implementation challenges.

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Peer debriefing among program managers and facilitators was conducted to strengthen trustworthiness and compare interpretations of field notes and interview findings. Quantitative data were analyzed by calculating participant numbers, production outputs, income, operational costs, surplus, social funds, measurable social benefits, and simple Social Return on Investment. To assess participants' recognition of local culture, a brief, literature-informed, open-ended assessment was administered before and after the cultural program. The assessment was adapted from cultural heritage awareness studies that used open-ended questions to explore students' understanding of and identification with cultural heritage elements, and from local heritage awareness studies that asked participants to nominate cultural and historical elements they recognized. The item also followed the broad domains of intangible cultural heritage, including performing arts, social practices, rituals, crafts, oral traditions, and other local cultural expressions.

The question used in both the pre- and post-assessment was: "*Name at least three cultural forms typical of Cirebon, such as traditional dances, performing arts, rituals, crafts, foods, or local historical-cultural symbols*." The same 10 purposively selected participants, consisting of five junior high school students and five senior high school students, were asked the question before and after the program. They were selected because they consistently participated in the cultural activities and represented the adolescent participants involved in Waroeng Batja. Responses were categorized as "*not yet recognizing local cultural forms*" when participants could not name any Cirebon cultural form, and as "*recognizing local cultural forms*" when participants could name at least three relevant cultural forms. Participants' names were recorded only for internal follow-up purposes and were anonymized in the article. The assessment records were retained as threshold-based pre- and post-assessment results, while individual raw counts of the exact number of cultural forms mentioned by each participant were not systematically retained.

RESULTS AND DISCUSSION

Waroeng Batja developed as a community-based informal school that integrates learning assistance, basic digital literacy, culture, social entrepreneurship, and community activities. Before the program was implemented, the main problems identified in Panguragan Lor Village were a low reading culture, limited learning assistance, students' difficulties participating in online learning, limited knowledge among students about local Cirebon culture, and underdeveloped entrepreneurship learning spaces for students and adolescents. After the program was implemented, visible changes emerged, including an increased variety of activities and the formation of an informal learning ecosystem.

Table 1. Waroeng Batja Program, Participants, Implementation Time, and Main Outputs

Program Area	Activities	Participants/ Partners	Implementation Time	Main Outputs
Entrepreneurship	Oyster mushroom and vegetable cultivation	Waroeng Batja participants and the surrounding community	During the program period	Participants learned production, processing, packaging, value creation, and local resource-based business practices.
Education and basic digital literacy	Learning assistance, reading aloud, review of school materials, homework mentoring, and English language learning	70 participants and 30 facilitators	Every Friday, Saturday, and Sunday afternoon	Students received informal learning assistance, reading habituation, support for school assignments, and basic digital learning support.

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Program Area	Activities	Participants/ Partners	Implementation Time	Main Outputs
Education and career counseling	Counseling for senior high school participants on higher education, employment, scholarships, and administrative preparation	Senior high school participants	Based on participants' needs	Participants obtained information on further study, employment, internships, and scholarship opportunities.
Local culture	Cirebon Mask Dance practice and public performance	Waroeng Batja participants and cultural facilitators	Every Sunday afternoon	Participants learned local culture and gained experience in public performance.
Social activities	Disaster response and biopore activities	15 disaster-affected residents and other beneficiaries	Incidental and community-based	Social solidarity, community care, and environmental awareness were strengthened.
Networks and collaboration	Collaboration with community groups, Karang Taruna, and student facilitators from various universities, including two from the University of Arkansas.	Local, national, and international partners	Based on program needs	Supporting networks, cultural exchange, and resource mobilization were established.

Source: Research 2025-2026

The Waroeng Batja ecosystem connects students, student facilitators, parents, the village government, local communities, business actors, and external partners. Qualitative findings in this section are drawn from periodic informal interviews, facilitator field notes, participatory observation, and activity documentation. A summary of the program, participants, implementation period, and main outputs is presented in **Table 1**.

Program Sustainability

One important finding from Waroeng Batja is its ability to mobilize 30 facilitators without a fixed payment scheme. In community-based service programs, facilitators are not merely support personnel but constitute the primary resource determining program sustainability. The main challenges in facilitator-based organizations include maintaining consistent attendance, assigning roles based on competence, preventing facilitator fatigue, and sustaining motivation when financial incentives are limited. Waroeng Batja responded to these challenges by assigning organizational roles, holding weekly meetings, forming learning groups, and adjusting the curriculum to meet participants' needs.

This pattern shows that facilitator management was carried out through participatory coordination rather than formal command. This practice aligns with studies on facilitator management that emphasize the importance of role management, communication, coordination, motivation, and sustainable contributions from facilitators in nonprofit organizations (Xu et al., 2024). Facilitators remained involved because they gained social value, teaching experience, broader networks, self-actualization, and opportunities to contribute to village education. Therefore, facilitator sustainability depended not only on funding but also

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on a sense of ownership of the social mission. This indicates that the innovation of Waroeng Batja lies not only in the variety of its programs but also in its community governance.

Social Entrepreneurship

The entrepreneurship component of Waroeng Batja was implemented through oyster mushroom and vegetable cultivation. This activity introduced students to the production process, the use of local resources, and the concept of added value. This approach is relevant to social entrepreneurship education because it combines production-based learning, skill development, economic benefits, and community care (Azqueta et al., 2023; Ndou, 2021). The entrepreneurship data show measurable economic and social outputs, as shown in **Table 2**.

Table 2. Production, Income, and Social Benefit Analysis of Waroeng Batja Entrepreneurship Activities

Component	Program Data	Main Calculation	Analysis Result
Mushroom production	400 baglogs; six harvests over three months; total harvest of 180 kg	Average harvest: 180 kg ÷ 6 = 30 kg/harvest; productivity: 180 kg ÷ 400 baglogs = 0.45 kg/baglog	Mushroom productivity was sufficient for community-scale entrepreneurship learning.
Vegetable production	80 m² planting area; total harvest of 120 kg	Sold vegetables: 65 kg × Rp8,000 = Rp520,000; distributed vegetables: 55 kg × Rp8,000 = Rp440,000	Unused land could be utilized productively and provide direct benefits to residents.
Operational costs	Baglogs, seeds, fertilizer, tools, maintenance, processing materials, packaging, transportation, and promotion	Total cost: Rp4,300,000	Cost data can be used to assess program efficiency and support future planning.
Business income	Sales of fresh mushrooms, processed mushroom products, and vegetables	Fresh mushrooms: Rp1,800,000; processed mushrooms: Rp3,840,000; vegetables: Rp520,000; total income: Rp6,160,000	Business income exceeded operational costs, resulting in a surplus of Rp1,860,000.
Added value	Oyster mushrooms processed into crispy mushroom products	Net added value: Rp48,000 – Rp18,000 – Rp12,000 = Rp18,000/kg; for 80 kg: Rp1,440,000	Processing increased the economic value of mushrooms compared with selling them fresh.
Social cash fund	30% of surplus/profit and buyer/community donations	30% × Rp1,860,000 = Rp558,000; total social cash fund: Rp558,000 + Rp400,000 = Rp958,000	Entrepreneurship activities contributed to a social cash fund for disaster response, biopore activities, learning support, and program capital.
Social benefits	45 students involved, 28 beneficiary families, 55 kg of vegetables distributed, and an estimated training value of Rp75,000/student	Training value: Rp3,375,000; distributed vegetables: Rp440,000; social cash fund: Rp958,000; total measurable benefit: Rp4,773,000	The program generated measurable social benefits through skills development, food support, and community-based social funding.

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Component	Program Data	Main Calculation	Analysis Result
Simple Social Return on Investment	Total measurable social benefit of Rp4,773,000; total program cost of Rp4,300,000	SROI: Rp4,773,000 ÷ Rp4,300,000 = 1.11	Each Rp1 of program cost generated approximately Rp1.11 of measurable social benefit.

Source: Research 2025-2026

The data in **Table 2** show three types of outputs. First, production outputs were reflected in the harvests of mushrooms and vegetables. Second, economic outputs were reflected in income, surplus, added value, and the social cash fund. Third, social outputs were reflected in students' involvement in production, in the distribution of vegetables to residents, and in the establishment of a social cash fund to support program sustainability. The added value was clearly evident in the processing of oyster mushrooms into crispy mushroom products. When sold fresh, mushrooms had a selling price of Rp18,000 per kg. After processing, one kg of mushrooms produced six packages with a selling price of Rp8,000 per package, equivalent to Rp48,000 per kg. After deducting the fresh mushroom value and processing cost of Rp12,000 per kg, the net added value reached Rp18,000 per kg. For 80 kg of processed mushrooms, the net added value reached Rp1,440,000. This finding shows that entrepreneurship learning did not stop at production but also included processing, packaging, promotion, and value creation.

The simple Social Return on Investment calculation produced a value of 1.11. This means that every Rp1 of program cost generates approximately Rp1.11 of measurable social benefit. This value represents not only financial gain but also social benefits derived from students' training, the distribution of harvest to residents, and the strengthening of community-based social funds. Therefore, Waroeng Batja's entrepreneurship activities can be positioned as an initial stage of social entrepreneurship incubation. Waroeng Batja's entrepreneurial outcomes are consistent with trends reported in prior studies of community service and social entrepreneurship. similar to other studies showing that student entrepreneurship training through aromatherapy candle production increases students' interest in candle making and entrepreneurship (Pisriwati et al., 2025).

Waroeng Batja did not measure entrepreneurial interest using the same indicator. However, the involvement of 45 students in cultivation, processing, packaging, marketing, and distribution indicates that students were exposed to a complete production and value-creation cycle. Other studies emphasize the digitalization of SMEs through online product marketing and social media management. At the same time, Waroeng Batja combines production-based entrepreneurship with basic digital learning support, community-based promotion, and social fundraising (Hanifa et al., 2023). This comparison shows that Waroeng Batja's contribution lies not only in entrepreneurship training but also in integrating production, learning assistance, digital support, and social benefit mechanisms into a single village-based informal learning ecosystem. This finding is also in line with the view that social entrepreneurship education should integrate knowledge, skills, local potential, and the creation of sustainable social value (Azqueta et al., 2023; Ndou, 2021).

Digital Literacy

Waroeng Batja responded to low reading interest, limited home-based learning assistance, and students' difficulties in participating in learning activities at formal schools. These problems indicate limitations in both reading literacy and basic digital literacy, namely, the ability of students and families to use devices, information, and digital media productively for learning. The reading-aloud program, school-material review, homework mentoring, and English-language learning served as initial strategies to address this

https://doi.org/10.17509/dedicated.v4i1.607

gap. Reading aloud served not only as a reading activity but also as a language interaction strategy between facilitators and students. At Waroeng Batja, students were not only asked to read but also encouraged to listen, repeat, answer questions, and connect reading content to daily experiences. This pattern is important because students who previously experienced learning difficulties received a more familiar, flexible, and less intimidating learning environment.

The observed changes after the program are evident in four qualitative indicators. First, students had access to a regular learning space near their homes. Second, students began to show greater confidence in reading and answering questions. Third, students received assistance in completing school assignments. Fourth, a habit of learning together gradually emerged. Periodic informal interviews with parents indicated that students' involvement in Waroeng Batja began to influence learning habits at home. Several parents reported that their children showed greater initiative in reopening learning materials, completing assignments, and asking for help when experiencing difficulties. One parent of a junior high school participant stated,

> *"Before joining Waroeng Batja, my child was usually very difficult to encourage to study. When there were online school assignments, my child often waited until I reminded them, and sometimes the assignments were not completed because they did not understand them. After joining learning activities at Waroeng Batja several times, my child began to open books independently and inform me more quickly about assignments. Now, my child is also more confident in reading, although not yet fully fluent,"*
>
> — Parent of junior high school participant

This change was also supported by facilitator field notes, which documented differences in students' participation, particularly in their willingness to answer questions, seek assistance, and complete school assignments. Although the level of improvement varied among participants, learning assistance at Waroeng Batja helped students understand material that had previously been difficult to follow independently. Waroeng Batja contributed to basic functional digital literacy. Students were assisted in understanding online school assignments, using learning information more purposefully, and receiving direct support when they could not follow online learning independently. This activity helped students not only complete school tasks but also develop learning habits, the confidence to ask questions, and the ability to use learning resources more appropriately.

Community-Based Learning

A pre- and post-intervention cultural recognition assessment was conducted with 10 purposively selected participants, comprising five junior high school students and five senior high school students. In the pre-assessment, all 10 participants were unable to mention at least three cultural forms typical of Cirebon and generally responded that they did not know. After participating in Waroeng Batja's cultural learning activities, including Cirebon Mask Dance practice and public performances, the same 10 participants were able to name at least 3 Cirebon cultural forms. Because the field notes retained the threshold-based assessment results rather than the full individual raw counts, this finding is interpreted as evidence of improved basic cultural recognition rather than as a measurement of the magnitude of cultural knowledge gain. The Cirebon Mask Dance became a medium for learning about cultural identity. Students were not only given information about local culture but were also involved as cultural actors. When participants learned Tari Topeng Samba, Klana, and Klana Barlen in the Gegesik style, participated in martial arts training, and performed at public events, there was a shift from not knowing the culture to performing it.

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This shift is important because cultural identity is formed through practice, symbols, social recognition, and collective experience.

From a psychological perspective, according to Bandura in "*Self-efficacy: The exercise of control"*, public performance can increase self-confidence because students gain successful experiences, recognition from their environment, and the courage to appear before the community. In the self-efficacy theory, mastery experience is an important source of one's belief in personal ability. Structured physical activity, such as martial arts, can also help strengthen students' self-efficacy (Mathunjwa et al., 2025; Moore et al., 2023). Thus, dance and martial arts training not only produced artistic or physical skills but also developed courage, discipline, and pride in local identity.

Periodic informal interviews with junior and senior high school participants showed that several students initially did not understand the meaning of the Mask Dance and felt less confident performing in public. After participating in regular practice and public performances, they reported greater confidence, discipline, and an initial understanding of local Cirebon culture. One junior high school participant involved in the cultural program stated,

> *"At first, I felt embarrassed to dance in front of many people, especially because during practice I still often made mistakes in the movements. However, after practicing and performing frequently, I became more confident. Now I know that the Mask Dance is not only about movement, but also part of Cirebon culture that must be preserved,"*
>
> — Junior high school participant involved in the cultural program

A similar pattern was reported by one cultural facilitator involved in Cirebon Mask Dance training. According to the facilitator, changes among participants were not only seen in their ability to follow movements but also in their discipline, courage, and curiosity about local culture,

> *"At the beginning of the practice sessions, many students were still joking around, shy, and did not yet understand why they needed to learn traditional dance. After several practice sessions and performances at village events, they began to become more disciplined, arrive more punctually, and perform with greater confidence,"*
>
> — Cultural facilitator for Cirebon Mask Dance training

These findings show that the cultural program of Waroeng Batja functioned not only as an art activity but also as a space for character formation, recognition of local identity, and the development of students' self-confidence.

Pre- and Post-Intervention

The reflection stage was strengthened through a pre- and post-intervention comparison based on participant records, activity documentation, facilitator notes, informal interviews, and entrepreneurship records. Before the program, Panguragan Lor Village did not yet have a regular informal learning space that integrated reading assistance, school assignment mentoring, digital literacy support, local cultural learning, and social entrepreneurship practice. After the intervention, Waroeng Batja provided regular learning assistance three times a week and involved 70 students, consisting of 23 elementary school students, 31 junior high school students, and 16 senior high school students, with the support of 30 student facilitators. This composition indicates that each facilitator assisted approximately 2-3 students, making the learning process more personal and participatory. In the cultural component, the pre-intervention assessment showed that none of the 10 purposively selected participants could identify at least 3 cultural forms typical of Cirebon.

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After the intervention, the same 10 participants were able to mention at least three Cirebon cultural forms and participated in Cirebon Mask Dance practice and public performances. This indicates a shift from limited cultural recognition to basic cultural identification and direct cultural participation. In the entrepreneurship component, 45 students were involved in oyster mushroom and vegetable cultivation. The program produced 180 kg of oyster mushrooms from 400 baglogs and 120 kg of vegetables from an 80 m² planting area. The economic output reached Rp6,160,000 in income and Rp1,860,000 in surplus. In addition, 30% of the surplus was allocated to social cash funds, resulting in Rp558,000, which increased to Rp958,000 after receiving community donations. These data show that the reflection stage not only identified qualitative changes in participation and confidence, but also documented measurable outputs in learning access, cultural involvement, production, income, social funds, and community benefits.

Table 3. Comparison of Pre- and Post-Intervention Conditions

Dimension	Pre-Intervention Condition	Post-Intervention Condition	Quantitative Evidence
Learning access	No regular integrated informal learning space	Regular learning assistance was conducted three times a week	70 students involved; 30 facilitators; ratio ±2-3 students per facilitator
Participant composition	Students had limited access to free learning assistance	Students from three educational levels participated	23 elementary, 31 junior high, and 16 senior high school students
Reading and school assistance	Students experienced learning difficulties and limited assignment assistance	Students received reading aloud, material review, homework mentoring, and English learning	70 students participated in regular learning activities
Basic digital literacy	Students needed support in understanding school instructions and online assignments.	Students were assisted in completing school-related digital tasks and searching for learning information.	Documented through assignment mentoring and facilitator records
Local culture	Participants had limited recognition of Cirebon cultural forms	Participants were able to mention local cultural forms and participated in the Cirebon Mask Dance practice and public performance	Pre-test: 0/10 participants were able to mention at least three Cirebon cultural forms; post-test: 10/10 participants were able to mention at least three Cirebon cultural forms
Entrepreneurship	No regular student-based entrepreneurship learning space	Students joined mushroom and vegetable cultivation, processing, packaging, and promotion	45 students involved; 400 baglogs; 180 kg mushrooms; 120 kg vegetables
Economic output	No recorded student-based production income	Entrepreneurship activities generated income and surplus	Rp6,160,000 income; Rp1,860,000 surplus
Social benefit	Social activities were not integrated with learning and entrepreneurship	Social cash funds and harvest distribution supported residents	Rp958,000 social fund; 55 kg vegetables distributed; 28 families benefited; 15 disaster-affected residents assisted
Program value	Program impact had not been measured financially	Social benefits were calculated through simple SROI	Rp4,773,000 measurable benefit; SROI 1.11

Source: Research 2025-2026

Table 3 shows that Waroeng Batja produced multidimensional changes. In the education component, the changes were reflected in the availability of a regular learning space and students' increased confidence

https://doi.org/10.17509/dedicated.v4i1.607

in reading and answering questions. In basic digital literacy, the changes were evident in the assistance provided to students in understanding online assignments and accessing educational information. In local culture, the changes appeared as a shift from not knowing it to participating in practices and public performances. In entrepreneurship, the changes were reflected in students' involvement in production and processing, and in their understanding of added value. In social networks, the changes were reflected in stronger collaboration and increased community trust.

Discussion

The findings of Waroeng Batja demonstrate that an integrated informal-school model that combines literacy assistance, basic digital literacy, local cultural learning, and social entrepreneurship can yield multidimensional outcomes for community service. This integration produced cross-domain reinforcement: digital literacy support strengthened students' ability to complete school assignments, cultural participation enhanced self-confidence that transferred to other learning contexts (Vázquez-Parra et al., 2023), and entrepreneurship practice anchored in local resources generated a simple Social Return on Investment of 1.11 while engaging 45 students in the full cycle of production, processing, and value creation (Azqueta et al., 2023; Ndou, 2021).

The program's reliance on 30 volunteer facilitators further indicates that community service programs need not depend on substantial financial resources when supported by participatory governance, role distribution, and intrinsic motivation (Xu et al., 2024). Several limitations should be acknowledged. The study relied on participatory observation, informal interviews, and program-internal records rather than externally validated assessments; the pre- and post-cultural assessment used a threshold-based metric rather than detailed knowledge measurement; and generalisability is limited because Waroeng Batja operates in a specific village context with particular cultural assets (Cirebon Mask Dance) and partnership configurations. Replication in other settings would require contextual adaptation, particularly regarding local cultural resources, facilitator availability, and partner networks.

CONCLUSION

The implementation of Waroeng Batja demonstrates that an informal school model grounded in literacy, local culture, and social entrepreneurship can serve as a contextual strategy for community service. The program involved 70 participants and 30 student facilitators, integrating regular learning assistance, basic digital literacy support, Cirebon Mask Dance practice, and oyster mushroom and vegetable cultivation through participatory collaboration with the village government, local communities, and external partners. The main contributions of the program include increased access to informal learning, strengthened basic digital literacy, improved recognition of local culture, measurable entrepreneurship outputs (180 kg of mushrooms, 120 kg of vegetables, Rp6,160,000 in income, Rp958,000 in social cash funds, and a simple Social Return on Investment of 1.11), and the development of cross-actor community networks. Replication in other villages should be supported by participatory problem mapping, clear distribution of facilitator roles, locally grounded activities, data-based evaluation, and digital media for documentation and network expansion.

https://doi.org/10.17509/dedicated.v4i1.607

AUTHOR'S NOTE

The authors declare that this article is original and has not been published or submitted for publication elsewhere. The authors also declare that there is no conflict of interest related to the publication of this article. The data reported in this article were obtained from program documentation, informal interviews, field notes, participant records, and simple financial records of Waroeng Batja activities. The identities of interview participants were anonymized to protect their privacy.

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