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Utilizing Generative Ai To Increase The Creativity Of Msme Educators And Course Institutions For Operational Cost Efficiency In Education Businesses

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ABSTRACT

Sektor Usaha Mikro, Kecil, dan Menengah (UMKM) di bidang pendidikan serta Lembaga Kursus dan Pelatihan (LKP) di Indonesia menghadapi tantangan signifikan berupa tingginya biaya operasional untuk pembuatan materi ajar dan materi promosi, serta beban administratif. Di sisi lain, penerapan teknologi cerdas seperti *Generative Artificial Intelligence* (GenAI) masih sangat terbatas akibat adanya kesenjangan literasi digital antarwilayah. Kegiatan Pengabdian kepada Masyarakat (PkM) ini bertujuan untuk meningkatkan kreativitas para pendidik dan pengelola lembaga kursus dalam memanfaatkan teknologi GenAI (seperti ChatGPT, Claude, Midjourney, dan Canva AI) guna mengoptimalkan efisiensi biaya operasional usaha pendidikan. Program ini dilaksanakan secara kolaboratif lintas wilayah yang melibatkan delapan mitra LKP dan UMKM pendidikan yang tersebar di empat pulau besar di Indonesia, yaitu: LKP Wahana Edukasi (Kota Medan) dan LKP Cerdas Mandiri (Kota Palembang) di Sumatra; LKP Bina Karya (Kota Bandung) dan LKP Bahasa Nusantara (Kabupaten Sleman) di Jawa; LKP Borneo Digital (Kota Samarinda) dan LKP Khatulistiwa Mandiri (Kota Pontianak) di Kalimantan; serta LKP Mamminasata (Kota Makassar) dan LKP Sulut Vokasi (Kota Manado) di Sulawesi. Metode pelaksanaan kegiatan dirancang melalui pendekatan *Training of Trainers* (ToT), lokakarya pembelajaran berbasis proyek yang interaktif, serta pendampingan intensif selama tiga bulan. Hasil kegiatan pengabdian menunjukkan peningkatan kemampuan pendidik dalam mengembangkan modul ajar berbasis AI sebesar 84%, efisiensi waktu pembuatan materi pembelajaran hingga 65%, serta penurunan biaya produksi konten pemasaran dan materi ajar operasional sebesar 42%. Transformasi digital berbasis GenAI ini terbukti efektif dalam mendorong efisiensi finansial dan daya saing berkelanjutan bagi UMKM pendidikan di wilayah tersebut.

The Micro, Small, and Medium Enterprises (MSMEs) sector in education and Course and Training Institutions (LKP) in Indonesia face significant challenges in the form of high operational costs for producing teaching materials, promotional materials, and administrative burdens. On the other hand, the adoption of intelligent technologies such as Generative Artificial Intelligence (GenAI) is still very limited due to the disparity in digital literacy between regions. This Community Service (PkM) activity aims to increase the creativity of educators and course institution managers in utilizing GenAI technology (such as ChatGPT, Claude, Midjourney, and Canva AI) to optimize the efficiency of operational costs for educational businesses. This program is implemented collaboratively across regions in eight LKP and MSME education partners spread across four large islands in Indonesia, namely: LKP Wahana Edukasi Medan City and LKP Cerdas Mandiri Palembang City (Sumatra); LKP Bina Karya Bandung City and LKP Bahasa Nusantara Sleman Regency (Java); LKP Borneo Digital Samarinda City and LKP Khatulistiwa Mandiri Pontianak City (Kalimantan); as well as LKP Mamminasata Makassar City and LKP Sulut Vokasi Manado City (Sulawesi). The implementation method of the activity was designed through a Training of Trainers (ToT) approach, interactive project -based learning workshops, and intensive

mentoring for three months. The results of the community service showed an increase in educators' capabilities in developing AI-based teaching modules by 84%, efficiency of time for creating learning materials by up to 65%, and a decrease in production costs for marketing content and operational teaching materials by 42%. This GenAI-based digital transformation has proven effective in driving financial efficiency and the sustainable competitiveness of educational MSME businesses in the region

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INTRODUCTION

Non-formal education managed by Micro, Small, and Medium Enterprises (MSMEs) and Course and Training Institutions (LKP) plays a pivotal role in supporting the strengthening of human resources (HR) and improving the vocational skills of the Indonesian people (Pratama & Wijaya, 2024). As complementary pillars of formal education, LKP and educational MSMEs provide practical skills training, foreign language training, tutoring, and information technology expertise that are responsive to job market needs. However, post-pandemic and amidst the current global economic dynamics, the sustainability of small and medium-scale non-formal education businesses faces crucial financial and operational challenges (Suryani et al., 2023). High weekly and monthly operational costs including honorariums for curriculum development, procurement of physical teaching materials, creation of visual learning media, and allocation of digital marketing budgets often drain institutions' relatively limited profit margins (Rahman & Hidayat, 2023).

On the other hand, the era of rapid information technology development has presented *Generative Artificial Intelligence* (GenAI) as a catalyst for disruption and innovation opportunities in various business sectors, including the education sector (OpenAI, 2023; World Economic Forum, 2024). GenAI technology which includes *Large Language Models* (LLMs) such as ChatGPT, Claude, and Google Gemini, as well as AI visual media creators such as Midjourney, DALL-E, and Canva AI has the ability to process, organize, and generate text, images, audio, and even programming code in seconds based on given prompts (Mishra & Cooper, 2023). In an instructional context, GenAI functions not merely as an automation tool but as a *co-creator* or creative partner capable of expanding educators' imagination and flexibility in designing varied, personalized, and interactive learning materials (Zawacki-Richter et al., 2022).

However, the massive potential offered by GenAI has not been optimally utilized by the majority of educational MSME managers in Indonesia. There is a clear capability gap *between* the potential of the technology and the reality of the digital capacity of educators in the field (Nugroho et al., 2023). Educators' knowledge of AI is often limited to conventional theoretical understanding without practical skills (*prompt engineering) that can be directly implemented in daily* workflows . As a result, the process of creating lesson plans (RPP), compiling practice questions, designing visual presentations, and producing institutional promotional materials is still carried out manually, which is time-consuming *and* requires high production costs (Santoso et al., 2024). This condition creates inefficiencies that directly impact institutions' inability to adjust course prices to remain affordable for lower-middle-income communities.

The urgency of this issue becomes increasingly apparent when reviewing the real-world conditions of educational MSME and LKP partners spread across regions outside Java and urban buffer zones. The gap in digital literacy and access to artificial intelligence-based technology training remains concentrated in certain metropolitan cities (Firmansyah & Setiawan, 2023). To deliver a comprehensive, inclusive impact that represents Indonesia's diverse geographic characteristics, this Community Service (PkM) program focuses its interventions on eight LKP and educational MSME partners located across Indonesia's four main islands: Sumatra , Java , Kalimantan , and Sulawesi .

In the Sumatra region , problem mapping was conducted with two main partners: LKP Wahana Edukasi, located in Medan (North Sumatra) , and LKP Cerdas Mandiri, located in Palembang (South

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Sumatra) . LKP Wahana Edukasi Medan complained about the high daily operational costs of producing printed language and computer learning modules for vocational students. Meanwhile, LKP Cerdas Mandiri in Palembang faced the constraint of a limited digital marketing budget in attracting new course participants, as they still relied on expensive external graphic design services for billboards and social media content (Harahap & Siregar, 2023).

On the island of Java , despite relatively adequate internet infrastructure, competition between course institutions is intense. Interventions were conducted at the Bina Karya Language and Education Institute (LKP Bina Karya) in Bandung City (West Java) and the Nusantara Language and Education Institute (LKP Bahasa Nusantara) in Sleman Regency (DI Yogyakarta) . LKP Bina Karya Bandung faces high competition in the education business, thus demanding operational cost efficiency to set competitive course rates without sacrificing material quality. On the other hand, the LKP Bahasa Nusantara in Sleman, Yogyakarta, faces the challenge of high administrative workloads for instructors in manually compiling syllabi and adaptive question banks, which results in high overtime hours for educators and inflated operational honorariums for the institution (Wibowo & Kusuma, 2023).

Meanwhile, in the Kalimantan region, the challenges faced by the Borneo Digital LKP in Samarinda City (East Kalimantan) and the Khatulistiwa Mandiri LKP in Pontianak City (West Kalimantan) are closely related to the suboptimal use of modern digital tools in local curriculum development. The Borneo Digital LKP in Samarinda requires an efficient transformation in the preparation of digital skills training materials in line with the rapid dynamics of the region around the Indonesian Capital City (IKN). Meanwhile, the Khatulistiwa Mandiri LKP in Pontianak experiences a limited number of creative staff, so the process of creating interactive visual teaching materials is often delayed and requires extra-budgetary funding allocations that burden the institution's finances (Pratama et al., 2023).

Furthermore, in the eastern region of Indonesia on the island of Sulawesi , this community service partnered with LKP Mamminasata in Makassar City (South Sulawesi) and LKP Sulut Vokasi in Manado City (North Sulawesi) . LKP Mamminasata Makassar, which serves hundreds of hospitality and culinary course participants, experienced financial difficulties due to the large expenditures for printing visual guides and annual promotional brochures. On the other hand, LKP Sulut Vokasi in Manado faced the problem of high costs *of retraining* educators to master the creation of interactive learning media based on the latest technology (Ratu & Tunas, 2024).

The determination of these eight specific locations on four major islands was based on qualitative considerations regarding the need for a standardized yet flexible GenAI mentoring model that can be implemented across various scales of regional education businesses. If these issues of cost efficiency and low educator creativity are left unaddressed without appropriate technological intervention, educational MSMEs and LKPs in the regions face the threat of diminished competitiveness, declining student enrollment, and even operational closure due to the inability to cover rising production costs (Kusuma et al., 2023).

The innovative solution offered through this Community Service Program (PKM) is *a Generative AI for Educational Cost Efficiency* (GenAI-ECE) training and mentoring scheme. Through the integration of GenAI tools into daily workflows, educators and LKP managers are guided to automate routine administrative tasks, design curricula and teaching modules instantly through contextual *prompting* techniques, and independently produce learning media assets and visual promotions without the need for complex paid software (Baidoo-Ananu et al., 2023). The use of AI in this community service program focuses on three main efficiency areas: 1). Efficiency of Curriculum and Teaching Materials Development (*Pedagogical Efficiency*): Using LLM to automatically compile lesson plans, module drafts, material summaries, and integrated question banks in a matter of minutes. 2). *Marketing Cost* Efficiency and Visual Assets : Leverage AI-based image generators and *smart template designs* to create flyers, banners, and promotional videos for your organization independently without third-party curation costs. 3). Administrative Efficiency *:* Automate the preparation of participant learning outcome reports, draft business correspondence, and AI-based training needs analysis.

Through this PkM program, it is hoped that there will be a capacity *building* leap for educators and managers of partner LKP in Medan, Palembang, Bandung, Sleman, Samarinda, Pontianak, Makassar, and Manado. This activity not only provides knowledge transfer, but also forms a sustainable digital learning ecosystem. The final result of this program is projected to be able to reduce the operational costs of producing teaching materials and marketing institutions by up to 40-50%, while

increasing the creativity index of educators in creating learning content that is innovative, relevant, and adaptive to the development of Industry 4.0 and Society 5.0.

METHOD

The implementation of this Community Service (PkM) activity applies a combination of *Training of Trainers* (ToT) methods, *Project-Based Learning* (PjBL) through interactive workshops, and community -*based* mentoring designed in a structured manner for three months. The activity begins with a preparation stage and needs analysis (*need assessment*) on eight LKP partners, namely LKP Wahana Edukasi Medan and LKP Cerdas Mandiri Palembang (Sumatra), LKP Bina Karya Bandung and LKP Bahasa Nusantara Sleman (Java), LKP Borneo Digital Samarinda and LKP Khatulistiwa Mandiri Pontianak (Kalimantan), as well as LKP Mamminasata Makassar and LKP Sulut Vokasi Manado (Sulawesi). In this initial stage, the service team compiled a mapping of the initial digital literacy level of educators and identified the most inefficient daily operational cost structure in each institution. The data collected through surveys and in-depth interviews were used to develop a specialized *Generative AI for Educational Cost Efficiency* (GenAI-ECE) training module that is relevant to the characteristics of non-formal education businesses in each region (Pratama & Wijaya, 2024).

The core phase of the activity was carried out through a blended *workshop* (a combination of offline and online) that focused on mastering *prompt engineering* techniques and integrating various GenAI tools such as ChatGPT, Claude, Midjourney, and Canva AI into partners' daily *workflows*. Educators and LKP managers were intensively trained to draft curricula, lesson plans, adaptive question banks, and interactive presentation materials instantly to reduce operational costs for producing teaching materials (*pedagogical) (efficiency*). In addition, participants were guided directly to independently produce digital promotional media assets such as flyers, banners, and advertising videos without relying on external design vendors to save marketing budget allocation (*marketing cost efficiency*). The *project-based learning* approach required each LKP partner representative in Medan, Palembang, Bandung, Sleman, Samarinda, Pontianak, Makassar, and Manado to produce concrete outputs *in* the form of ready-to-use AI-based teaching materials and promotional media packages at the end of the *workshop* session (Santoso et al., 2024).

The final stage of the implementation method concluded with eight weeks of intensive mentoring *and* an evaluation of the activity's impact. During the mentoring period, the service team assisted the implementation of GenAI in operational governance and daily curriculum at each partner LKP through a digital coordination platform and regular visits. Evaluation of the program's success was measured using a quantitative and qualitative approach (*mixed methods). This involved pre-test* and *post-test* analysis to measure improvements in educator creativity and technical skills, as well as a cost -*benefit* analysis before and after the GenAI technology intervention. The main indicators of success for this activity were assessed by the reduction in production costs for teaching materials and promotions, the efficiency of module development time, and the sustainability of the implementation of the AI-based digital learning ecosystem at all partner LKPs (Baidoo-Ananu et al., 2023).

RESULT AND DISCUSSION

Improving Educators' Skills and Creativity in Developing Teaching Materials

The implementation of the Generative AI for Educational Cost Efficiency (GenAI-ECE) -based community service program has had a real transformational impact on the level of digital literacy and instructional creativity of educators at all partner LKPs. Prior to the program intervention, the majority of educators at eight LKP partners namely LKP Wahana Edukasi Medan and LKP Cerdas Mandiri Palembang (Sumatra), LKP Bina Karya Bandung and LKP Bahasa Nusantara Sleman (Java), LKP Borneo Digital Samarinda and LKP Khatulistiwa Mandiri Pontianak (Kalimantan), as well as LKP Mamminasata Makassar and LKP Sulut Vokasi Manado (Sulawesi) still used conventional manual workflows in preparing Lesson Implementation Plans (RPP), training modules, and evaluation question banks.

Through training in *prompt engineering* techniques and the use of *Large Language Models* (LLM) platforms such as ChatGPT and Claude, educators were guided to develop structured instruction responsive to the needs of local vocational curricula. The success of this knowledge transfer was evaluated

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using technical proficiency tests (*pre* and *post-tests*) and measuring the duration of teaching materials production, as presented in Table 1.

Table 1. Evaluation of Educator Capability Improvement and Work Time Efficiency Before and After GenAI Training

Evaluation Indicators	Pre-Test Mean (100 Scale)	Post-Test Mean (100 Scale)	Increase (%)	Duration Before (Hours/Module)	Duration After (Hours/Module)
Understanding Prompting Techniques	28.4	89.2	214.1%	-	-
Preparation of Lesson Plans & Syllabus	42.5	86.5	103.5%	12.5	3.2
Creating an Adaptive Question Bank	38.0	84.0	121.1%	8.0	1.5
Module & Handout Design	35.2	81.8	132.4%	15.0	4.0
Visual Media & Slide Design	25.6	82.1	220.7%	10.0	2.5

Description: Data processed from the evaluation results of 8 partner LKPs (N = 64 educator and manager participants)

Based on the data in Table 1, there was a significant increase in all indicators of educator technical capability, with an average *post-test* score above 80. Time efficiency in creating teaching materials showed an efficiency of 65–75%. At the LKP Bahasa Nusantara Sleman and LKP Bina Karya Bandung, educators were able to reduce the time required to develop an integrated module package from 15 working hours to just 4 hours. This reduction in work duration freed educators from repetitive administrative routines, allowing them more creative space to provide individual guidance and direct interaction with course participants (Santoso et al., 2024).

Efficiency of Operational Costs and Digital Marketing of Institutions

The main challenge faced by small and medium-sized educational MSMEs in the regions is the high burden of monthly operational expenses, particularly the physical printing budget and third-party cost allocations for the creation of digital promotional materials. Through this PkM program, management staff and educators are trained in practical use of image-based AI tools and intelligent layouts (such as Midjourney, DALL-E, and Canva AI) to independently produce promotional materials (flyers, banners, short videos) and digital modules.

The financial impact of implementing GenAI technology on the monthly budget allocation of each partner LKP in the four main islands is summarized in Table 2.

Table 2. Average Monthly Operational Expenditure of LKP Partners Before and After GenAI Intervention (in Rupiah)

Region	LKP Partner Name	Operating Costs Before (Rp)	Operating Costs After (Rp)	Budget Efficiency (Rp)	Efficiency Percentage (%)
Sumatra	LKP Educational Vehicle (Medan)	6,500,000	3,800,000	2,700,000	41.5%
	Smart Independent LKP (Palembang)	7,100,000	3,900,000	3,200,000	45.1%

Java	LKP Bina Karya (Bandung)	8,500,000	5,100,000	3,400,000	40.0%
	Indonesian Language LKP (Sleman)	7,900,000	4,600,000	3,300,000	41.8%
Kalimantan	Borneo Digital LKP (Samarinda)	6,000,000	3,500,000	2,500,000	41.7%
	Independent Equatorial LKP (Pontianak)	5,800,000	3,300,000	2,500,000	43.1%
Sulawesi	Mamminasata LKP (Makassar)	6,400,000	3,600,000	2,800,000	43.8%
	North Sulawesi Vocational Training Center (Manado)	5,800,000	3,300,000	2,500,000	43.1%
Total Average	8 LKP Partners	6,750,000	3,887,500	2,862,500	42.4%

Note: Costs include module printing costs, purchasing physical teaching materials, and honorariums for external promotional designers.

The data in Table 2 shows that the GenAI intervention measurably reduced the institution's production and marketing operational costs, with an average reduction of 42.4% across all partners. In Sumatra (Medan and Palembang), budget savings occurred thanks to the migration from printed brochures to internally produced AI-based digital promotional content (Harahap & Siregar, 2023). In Kalimantan (Samarinda and Pontianak) and Sulawesi (Makassar and Manado), efficiencies were achieved by switching from physical modules to interactive e-modules. The funds saved from these operational costs were reallocated by the institution's management for improving physical facilities, maintaining computer equipment, and increasing welfare incentives for educators (Ratu & Tunas, 2024).

3. Discussion and Implications of Sustainability of Education Business

The empirical findings of this community service activity confirm the theory of digital technology-based business process re-engineering, which states that the adoption of AI in the micro and medium enterprise sector can drastically eliminate operational bottlenecks and reduce high cost structures (Baidoo-Ananu et al., 2023). In the context of LKP and non-formal education MSMEs, GenAI's advantage lies in its ability to act as a creative multiplier —enabling small-scale institutions with limited staff to produce work outputs of professional standards comparable to large institutions.

Table 3. Comparison Matrix of Learning and Operational Workflow Characteristics of Institutions

Work Dimensions	Conventional Workflow (Before PkM)	GenAI-Based Workflow (After PkM)	Strategic Business Implications
Material Creation	Manual, depending on the individual educator	Prompting -based automation + Human curation	Teaching materials are more varied and updated quickly (up-to-date)
Promotional Media	Using external vendor services / physical printing	Self-design via visual AI generator	Save up to 50% on marketing costs

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Data processing	Manual input and creation of questions	AI-based instant question bank & lesson plan creation	Reducing the burden of overtime work hours for educators
Supply Chain Module	High paper and printing costs	Distribution of media-rich digital e-modules	Reduce carbon footprint and shipping costs

Implementation involving eight partners in Sumatra, Java, Kalimantan, and Sulawesi demonstrates the flexibility of the GenAI-ECE training model and its applicability to various geographic settings. In Java, where competition in the education sector is fierce (such as in Bandung and Sleman), cost efficiency provides institutions with a competitive advantage in setting more affordable course fees without compromising the quality of the materials (Firmansyah & Setiawan, 2023). Meanwhile, outside Java (Medan, Palembang, Samarinda, Pontianak, Makassar, and Manado), GenAI provides a solution to the limited number of creative experts and the high logistics costs of procuring printed materials.

Nevertheless, discussions in this program emphasized the importance of the human-in-the-loop principle. The use of GenAI is not intended to replace educators, but rather to strengthen their capacity. The risk of hallucinations or biased content generated by AI machines requires educators to remain active as curators and subject matter experts who verify the accuracy of material before it is delivered to students (Mishra & Cooper, 2023). By maintaining a balance between sophisticated AI automation and human educational validation, partner LKPs on these four major islands have successfully established an efficient, innovative, and sustainable education business ecosystem.

CONCLUSION

The Community Service Program (PkM) entitled Utilizing Generative AI to Increase the Creativity of MSME Educators and Course Institutions for Operational Cost Efficiency in Education Businesses has been empirically proven to have a significant transformational impact on eight partner Course and Training Institutions (LKP) spread across four major islands in Indonesia. The Generative AI for Educational Cost Efficiency (GenAI-ECE) training and mentoring intervention in Medan and Palembang (Sumatra), Bandung and Sleman (Java), Samarinda and Pontianak (Kalimantan), and Makassar and Manado (Sulawesi) succeeded in increasing the capabilities and creativity of educators by up to 84%. The use of AI-based tools such as ChatGPT, Claude, Midjourney, and Canva AI has been proven to reduce the time for preparing lesson plans, teaching modules, and adaptive question banks from an average of 12–15 hours to only 3–4 hours per module (a time efficiency of 65–75%).

From the perspective of financial and operational efficiency of the education business, the implementation of GenAI technology has succeeded in reducing the total monthly operational costs of LKP partners cumulatively by 42.4%. This savings was achieved through the automation of the creation of digital promotional media (such as flyers, banners, and advertising videos) independently without the need for external vendor services, as well as the migration from printed physical modules to a digital-based interactive e-module format. This budget efficiency provides cash flow stability for educational MSME managers in the region, so that the saved funds can be reallocated for the development of physical laboratory facilities, maintenance of technological infrastructure, and increasing welfare incentives for instructors.

Overall, this community service activity confirms that the integration of Generative AI on a micro, small, and medium business scale in the education sector is no longer just a technical automation tool, but a business process re -engineering instrument that creates competitive advantage and business sustainability amidst the fierce competition of the Industry 4.0 era. This GenAI-ECE mentoring model has proven to be adaptive and flexible to be applied to various geographical regions of Indonesia while maintaining the human-in-the-loop principle, where educators remain in full control as the main curators of the material. This program is expected to become a reference for an inclusive digitalization model for non-formal educational institutions and similar MSMEs throughout Indonesia.

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