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OPTIMIZING GENERATIVE AI THROUGH HYBRID TRAINING TO ENHANCE RAILWAY VOCATIONAL STUDENTS' CAREER READINESS

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Abstrak

Transformasi digital dan perkembangan *Generative Artificial Intelligence* (*Generative* AI) telah membawa perubahan signifikan dalam praktik rekrutmen kerja, khususnya dalam penyusunan dokumen karier profesional seperti *Curriculum Vitae* (CV) dan surat lamaran kerja (*cover letter*). Mahasiswa vokasi sebagai calon lulusan siap kerja dituntut memiliki kemampuan adaptif terhadap perkembangan teknologi digital serta keterampilan dalam menyusun dokumen karier yang kompetitif dan selaras dengan standar industri. Namun demikian, masih banyak mahasiswa yang mengalami kesulitan dalam menghasilkan dokumen yang efektif, terstruktur, dan kompatibel dengan sistem *Applicant Tracking System* (ATS). Kegiatan pengabdian kepada masyarakat ini bertujuan untuk meningkatkan kesiapan karier mahasiswa vokasi di Kota Madiun melalui model pelatihan *hybrid* yang mengintegrasikan pemanfaatan *generative AI*. Program ini melibatkan 120 mahasiswa vokasi yang dibagi ke dalam empat kelas pelatihan. Tahapan pelaksanaan meliputi persiapan, pelatihan interaktif *hybrid*, serta evaluasi melalui *pretest* dan *posttest*. Aplikasi *Generative* AI yang digunakan meliputi *chatgpt*, *canva*, *text-to-speech*, dan *duolingo*. Hasil evaluasi menunjukkan adanya peningkatan signifikan pada pemahaman peserta, yang tercermin dari kenaikan skor *posttest*. Selain itu, CV dan *cover letter* peserta menunjukkan perbaikan pada aspek struktur, kualitas konten, optimasi ATS, dan tampilan visual. Peserta juga memberikan respons positif terhadap relevansi materi dan manfaat praktis pelatihan. Program ini menunjukkan bahwa pelatihan *hybrid* berbasis *generative* AI efektif dalam mendukung peningkatan literasi digital dan kesiapan karier mahasiswa vokasi, khususnya dalam menghadapi tuntutan kompetitif industri perkeretaapian.

Kata kunci: *generative artificial intelligence*; pelatihan *hybrid*; kesiapan karier; mahasiswa vokasi; industri perkeretaapian

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Abstract

Digital transformation and the advancement of Generative Artificial Intelligence (Generative AI) have reshaped recruitment practices, particularly in the preparation of professional career documents such as Curriculum Vitae (CV) and cover letters. Vocational students, as prospective work-ready graduates, are required to demonstrate digital adaptability and the ability to develop competitive career documents aligned with industry standards. However, many students still encounter difficulties in producing effective, structured, and Applicant Tracking System (ATS)-compatible documents. This community service program aimed to enhance the career readiness of vocational students in Madiun through a hybrid training model integrating Generative AI applications. The program involved 120 vocational students divided into four training classes. The implementation stages consisted of preparation, hybrid interactive training, and evaluation using pretest and posttest assessments. The Generative AI tools utilized included ChatGPT, Canva, Text-to-Speech, and Duolingo. The evaluation results demonstrated a significant improvement in participants' understanding, as reflected in the increased posttest scores. In addition, participants' CVs and cover letters showed notable improvements in structure, content quality, ATS optimization, and visual presentation. Participants also reported positive perceptions regarding the relevance and practical benefits of the training. The program indicates that hybrid training based on Generative AI effectively supports the enhancement of digital literacy and career readiness among vocational students, particularly in responding to the competitive demands of the railway industry.

Keywords: generative artificial intelligence; vocational students; hybrid training; career readiness; railway industry

INTRODUCTION

The rapid acceleration of digital transformation in the era of the Industrial Revolution 4.0 and Society 5.0 has generated fundamental changes across multiple sectors, including education and employment. Advances in Artificial Intelligence (AI) have contributed to the development of increasingly digitalized work ecosystems, where recruitment processes, administrative screening, and candidate evaluations are frequently conducted through automated, data-driven systems (Deguchi et al., 2020). Within this evolving landscape, individuals' ability to adapt to digital technologies is no longer considered supplementary but rather a core competency that determines graduates' competitiveness in the modern labor market.

Vocational education, as emphasized in the Presidential Regulation of the Republic of Indonesia Number 68 of 2022, is oriented toward strengthening applied competencies, work readiness, and alignment with the needs of industry and the business sector. The paradigm shift from a supply-oriented to a demand-oriented approach requires vocational institutions not only to produce technically competent graduates but also to foster adaptability to technological advancements and industrial dynamics (Kamaruzaman et al., 2025; Zuo et al., 2025). One of the critical challenges vocational students face is career readiness, particularly in preparing professional documents such as a Curriculum Vitae (CV) and cover letters.

CVs and cover letters serve as essential instruments in professional communication between applicants and recruiters. However, numerous studies indicate that many students and fresh graduates still lack adequate skills to develop effective, well-structured career documents aligned with industry

standards (Kholifah et al., 2025; Otermans et al., 2025; Selamat et al., 2025). Common issues include inappropriate formatting, weak personal branding, insufficient use of relevant keywords, and low compatibility with Applicant Tracking Systems (ATS), which are widely utilized in modern recruitment practices (Chavan et al., 2024; Okolie & Irabor, 2017). These limitations directly reduce candidates' chances of passing initial administrative screening stages, regardless of their actual technical competencies.

Conversely, the emergence of Generative AI presents strategic opportunities to enhance career preparation processes. Generative AI technologies enable users to generate, optimize, and personalize professional content more efficiently and accurately. The utilization of digital applications such as ChatGPT, Canva, Text-to-Speech (TTS), and Duolingo has demonstrated potential in improving digital literacy, professional communication skills, and the quality of career documents (Anggoro & Pratiwi, 2025; Pratiwi & Waluyo, 2024; Waluyo & Pratiwi, 2025). Beyond functioning as technical tools, Generative AI platforms also act as adaptive learning media that reinforce essential 21st-century competencies, including creativity, communication, and problem-solving abilities.

Vocational students in Madiun, particularly those specializing in railway-related fields, face increasingly complex competitive challenges. The national and global railway industries demand graduates who are not only technically proficient but also capable of presenting strong professional profiles through high-quality career documentation. Intensifying competition in both domestic and international labor markets highlights the necessity of systematic educational interventions aimed at strengthening students' career readiness (Pratiwi, 2025; Pratiwi et al., 2024). Community service initiatives represent an effective strategy to bridge this gap by implementing technology-based training programs.

This community service program was therefore designed as a hybrid training model (offline and online) focused on optimizing the use of Generative AI for developing CVs and cover letters. The hybrid model was selected to enhance accessibility, learning flexibility, and the effectiveness of knowledge and skills transfer (Marshall & Kostka, 2020; Ulla & Espique, 2022). The program involved 120 vocational students in Madiun, divided into four training classes, and supported by five professional instructors from both domestic and international backgrounds. The training approach integrated theoretical sessions, hands-on practice, simulations, and personalized mentoring to ensure that participants not only understood conceptual frameworks but were also able to produce tangible outputs in the form of professional CVs and cover letters.

The problems addressed in this program were: (1) how to enhance vocational students' career readiness through the utilization of Generative AI, and (2) how effective hybrid training is in improving the quality of students' career documents. Based on these problem formulations, the objectives of this community service activity were: (1) to improve participants' literacy and skills in utilizing Generative AI, (2) to enhance the quality of students' CVs and cover letters, and (3) to strengthen vocational students' career readiness in facing the competitive demands of the national and global railway industry. This initiative is expected to provide a meaningful contribution to strengthening vocational students' career competencies while supporting the broader agenda of digital transformation in vocational education aligned with sustainable industry needs.

The novelty of this community service program lies in the integration of multiple Generative Artificial Intelligence tools within a structured hybrid training model specifically designed to support vocational students in developing professional career documents. Unlike previous AI-based training initiatives that primarily focus on general digital literacy or the introduction of individual AI tools,

this program integrates career readiness development, ATS-oriented CV and cover letter preparation, and sector-specific vocational training within a single training framework. Furthermore, the program is contextualized for railway vocational students, aligning the training content with the demands of the railway industry and modern recruitment practices. Although the training model represents an applied adaptation rather than a fundamentally new theoretical framework, its contribution lies in demonstrating a practical and scalable approach for integrating Generative AI into community service programs aimed at enhancing vocational students' employability and digital competencies.

METHODS

This community service program adopted a hybrid training approach that combined offline (face-to-face) and online learning methods. The hybrid model was selected to provide flexibility in the learning process, broaden student participation, and optimize the effectiveness of knowledge transfer and digital skill development. This approach is particularly suitable for vocational students, who require direct hands-on practice while simultaneously benefiting from digital learning technologies (Marshall & Kostka, 2020; Ulla & Espique, 2022). To evaluate the outcomes of the training program, the activity adopted a pretest–posttest evaluation design to assess improvements in participants' understanding and skills after participating in the training program.

The participants in this community service program consisted of 120 vocational students specializing in railway-related programs in Madiun. The participants were selected using a purposive sampling technique, considering their relevance to the objectives of the training program and their need for career preparation related to the railway industry. The program was systematically designed through three primary stages: preparation, implementation, and evaluation.

During the preparation stage, the community service team conducted a needs analysis to identify the primary challenges vocational students in Madiun face in career readiness, particularly in developing Curriculum Vitae (CV) and cover letters. The analysis was conducted through an initial survey and informal discussions with the target participants to gain insights into their levels of digital literacy, understanding of professional career document standards, and prior experience with AI-based technologies. The findings revealed that most students still relied on conventional CV formats that were not optimized for modern recruitment practices, including compatibility with Applicant Tracking Systems (ATS). Based on these results, the training materials were developed to integrate key concepts, including professional career document development, personal branding strategies, ATS optimization, and the utilization of Generative Artificial Intelligence (Generative AI). In addition, technical coordination was undertaken, covering training schedules and the preparation of supporting facilities, such as training venues, presentation equipment, internet connectivity, and the readiness of digital applications used during the program.

The implementation stage was conducted through an interactive hybrid workshop that integrated theoretical sessions, demonstrations, hands-on practice, simulations, and personalized mentoring. The activity involved 120 vocational students divided into four training classes of 30 participants each to maintain effective interaction and mentoring intensity. The training design encouraged active participation through interactive lectures, group discussions, case studies, and guided practice. The training sessions began with strengthening participants' understanding of the strategic role of CVs and cover letters in recruitment processes, followed by explanations of modern CV structures, achievement-based writing techniques, and the importance of personal branding in professional documentation. Participants were subsequently introduced to ATS optimization

concepts, including the effective use of relevant keywords, machine-readable formatting, and the identification of common errors in career document preparation (Chavan et al., 2024; Okolie & Irabor, 2017).

As the core component of the program, participants received guided practice in utilizing Generative AI technologies through several digital applications. ChatGPT was used to assist participants in drafting, refining, and personalizing the content of their CVs and cover letters. Canva supported the development of visually appealing and professionally designed CV layouts. The Text-to-Speech (TTS) application was utilized as an evaluation tool for pronunciation and intonation, contributing to participants' oral communication readiness for job interviews. Meanwhile, Duolingo functioned as a medium for strengthening English language competencies relevant to global career documentation. Participants actively developed and revised their CVs and cover letters through guided exercises, supported by direct feedback from instructors. Previous studies have highlighted that AI-assisted training can significantly improve participants' digital competencies and the quality of professional documents (Haroud & Saqri, 2025; Pratiwi et al., 2023).

The training program was facilitated by five professional instructors from both domestic and international backgrounds, possessing expertise in recruitment and human resources, professional communication, career document design, digital literacy, and AI-based technologies. The involvement of professional instructors was intended to ensure that the materials and practices delivered during the training aligned with real-world industry expectations, particularly in the railway sector. The instructors' roles extended beyond delivering theoretical content to include application demonstrations, practice mentoring, and providing constructive feedback on participants' outputs.

The evaluation stage was conducted to assess the outcomes of the training program. Learning outcomes were measured using pretest and posttest instruments to identify improvements in participants' understanding of professional career documents, ATS optimization, and the utilization of Generative AI tools. The evaluation instruments consisted of knowledge tests, document assessment rubrics, and participant perception questionnaires. Prior to implementation, the instruments were reviewed by experts in vocational education and career development to ensure content validity.

Quantitative data obtained from the pretest and posttest were analyzed using descriptive statistical analysis, particularly through mean score comparisons to identify improvements in participants' understanding after the training program. In addition, participants' CVs and cover letters were evaluated before and after the training using indicators such as structural completeness, content quality, relevance to targeted positions, and visual design aspects. Meanwhile, qualitative feedback obtained from participant questionnaires was analyzed using descriptive qualitative analysis to capture participants' perceptions of the training materials, hybrid learning methods, instructor competence, and the practical benefits of the program.

The implementation method applied in this program was designed to ensure that the activity was not merely informative but also practical and transformative. By integrating a hybrid training model with the utilization of Generative AI, this community service program is expected to generate tangible improvements in vocational students' digital literacy and career readiness, particularly in addressing the competitive demands of the national and global railway industry.

RESULTS AND DISCUSSION

The implementation of the community service program through a hybrid training model was conducted according to the planned design and received positive responses from participants. The program, involving 120 vocational students in Madiun, was designed to enhance career readiness through the optimization of Generative AI, particularly in the preparation of CVs and cover letters. Throughout the training sessions, participants demonstrated high levels of engagement in both offline and online formats. Active interaction was observed during discussions, hands-on practice activities, and personalized mentoring sessions. These findings are consistent with previous community service studies, which emphasize that interactive training approaches significantly improve participant involvement and learning effectiveness (Pratiwi, 2025; Pratiwi et al., 2024).

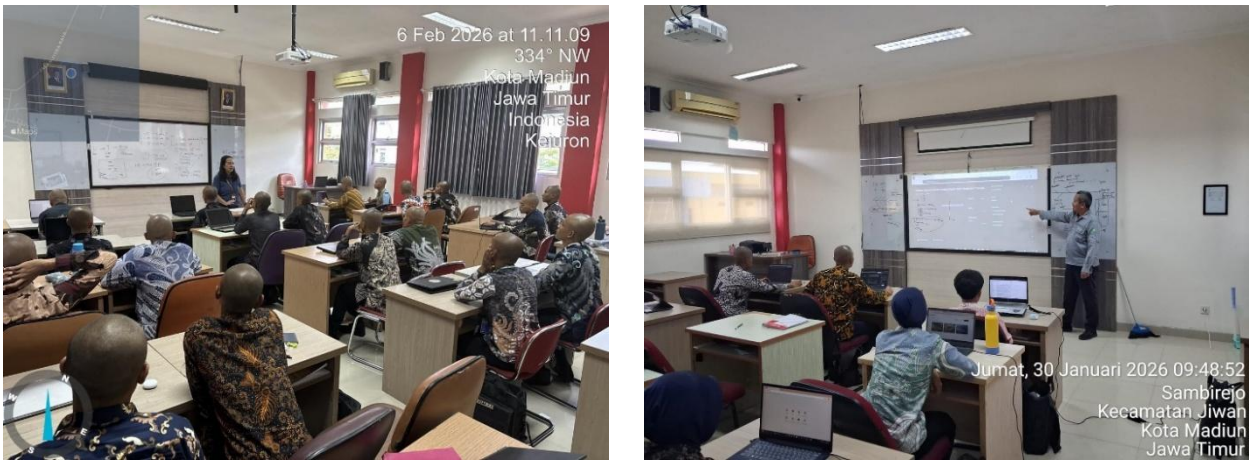

Figure 1. Offline training session

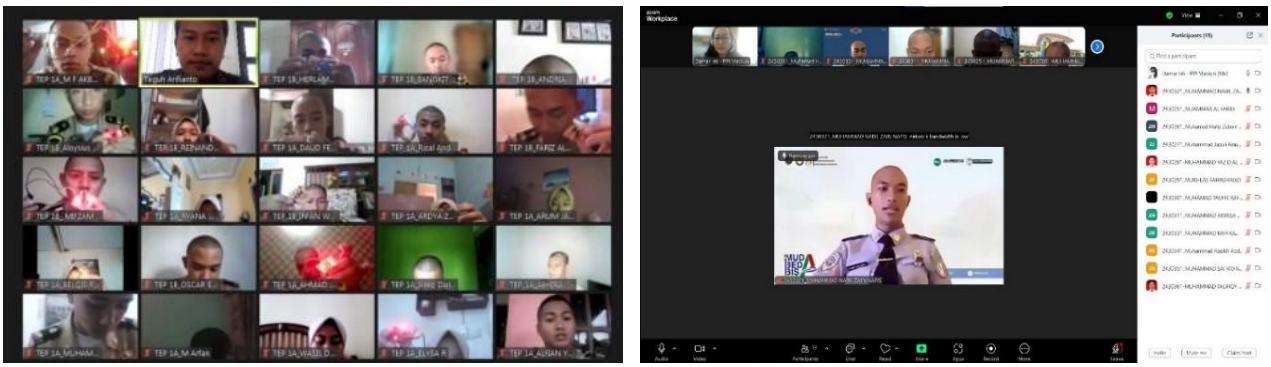

Figure 2. Online training session

Initial observations identified several challenges faced by participants, including limited understanding of professional CV structures, weak personal branding strategies, and insufficient awareness of the importance of optimizing career documents for compatibility with ATS. These issues align with earlier studies indicating that many students and fresh graduates continue to use conventional CV formats that do not meet modern recruitment standards (Chavan et al., 2024; Kholifah et al., 2025). Furthermore, although participants generally possessed basic digital literacy skills, the majority had not previously utilized AI-based technologies to support career preparation.

Similar conditions were reported in prior AI-based training programs, in which participants initially demonstrated limited familiarity with digital career tools but showed significant improvement after structured interventions (Anggoro & Pratiwi, 2023; Pratiwi & Waluyo, 2024; Waluyo & Pratiwi, 2025).

1. Learning Evaluation (Pretest–Posttest)

   To measure the effectiveness of the training, a learning evaluation was conducted using pretest and posttest assessments. The evaluation instruments were designed to assess participants' understanding of professional career documents, ATS optimization, and Generative AI utilization. The analysis revealed a substantial improvement in participants' scores following the training.

Table 1. Pretest and posttest evaluation results

Evaluation Component	*M Pretest*	*M Posttest*	*Improvement*
Understanding of Professional CV Structure	58.4	84.7	+26.3
Understanding of ATS Optimization	52.1	81.9	+29.8
Generative AI Utilization	49.6	86.3	+36.7
Overall Mean Score	53.4	84.3	+30.9

The increase of 30.9 points in the overall mean score indicates that the hybrid training program generated a meaningful impact on participants' conceptual understanding. The most significant improvement occurred in the Generative AI utilization component, suggesting that participants gained new knowledge and practical skills previously unfamiliar to them. This result reinforces prior research highlighting that the integration of AI technologies in training programs significantly enhances digital literacy and professional readiness (Otermans et al., 2025; Selamat et al., 2025; Zuo et al., 2025).

Figure 3. CV development practice using canva and chatgpt

2. Improvement in Career Document Quality

   Beyond cognitive evaluation, participants' CVs and cover letters were assessed before and after the training. The evaluation criteria included structural completeness, content quality, competency relevance, ATS keyword optimization, and visual design aspects. The results demonstrated consistent improvements across nearly all participants.

Prior to the training, most participants' CVs exhibited weaknesses in presenting achievement-based descriptions, inconsistencies in formatting, and limited use of relevant keywords aligned with targeted positions in the railway industry. Following the training, participants' CVs showed enhanced clarity of professional profiles, improved structural alignment with industry standards, and more modern, communicative visual designs. These findings are consistent with studies indicating that AI-assisted writing tools and digital design platforms contribute significantly to the effectiveness and visual appeal of professional documents (Sari, 2020; Waluyo & Pratiwi, 2025; Woo et al., 2023).

The utilization of ChatGPT proved particularly beneficial in assisting participants to articulate self-descriptions, work experiences, and academic achievements more systematically and professionally. Canva supported the creation of aesthetically appealing yet formal CV designs. Additionally, the TTS application provided supplementary benefits by enabling participants to evaluate pronunciation and intonation, while Duolingo contributed to strengthening English language competencies relevant to global career documentation. This integrated approach aligns with the literature describing Generative AI as a strategic tool for enhancing professional communication competencies (Anggoro & Pratiwi, 2023; Kohnke et al., 2023; Mogavi et al., 2024; Pratiwi & Waluyo, 2024).

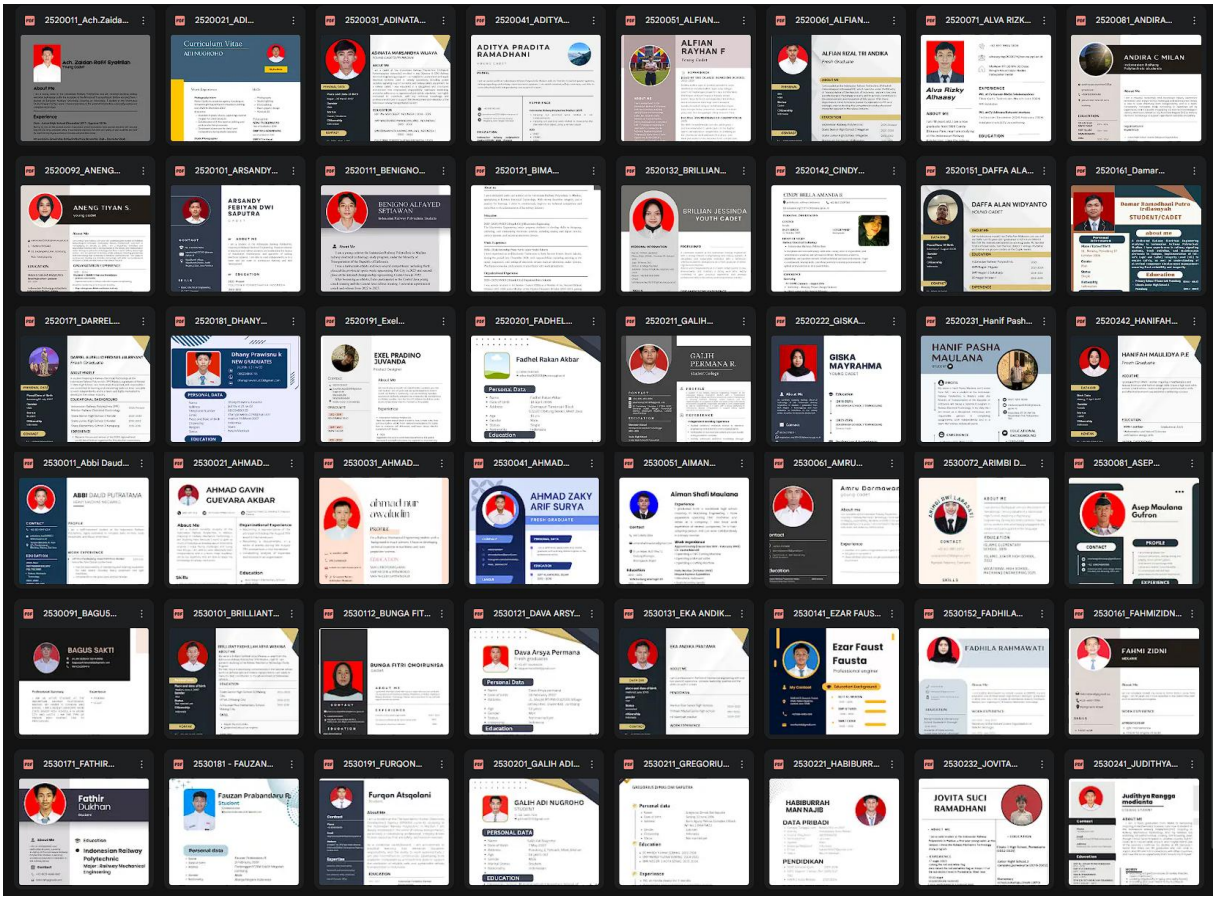

Figure 4. Sample CV outputs from participants

3. Participant Satisfaction and Program Implications

Participant perception evaluations revealed that the training program was considered relevant, practical, and directly beneficial for career preparation. A total of 92% of participants reported that the training improved their understanding of professional CV development, 89% indicated increased confidence in navigating recruitment processes, and 94% expressed interest in participating in advanced training on digital career technologies. These findings are consistent with previous community service programs, which have demonstrated that technology-based training positively influences participant motivation and work readiness (Haroud & Saqri, 2025; Kamaruzaman et al., 2025; Okolie & Irabor, 2017).

From a vocational education perspective, this initiative contributed to strengthening students' digital literacy, career readiness, and effective utilization of emerging technologies. The program not only enhanced participants' conceptual understanding but also produced tangible outputs in the form of professionally developed CVs and cover letters. In this context, the present initiative demonstrates how community service programs can serve as practical platforms for implementing emerging digital technologies, such as Generative AI, to support vocational students' career preparation (Pratiwi, 2025; Pratiwi et al., 2024).

Overall, the results indicate that hybrid training based on Generative AI is effective in enhancing vocational students' career readiness. Improvements in evaluation scores, career document quality, and positive participant feedback collectively reflect the program's success. The integration of Generative AI into community service activities represents a relevant strategy for supporting digital transformation in vocational education and improving graduate competitiveness within the national and global railway industry (Arifianto et al., 2021; Deguchi et al., 2020; Ulla & Espique, 2022).

4. Outputs of the Community Service Program

This community service initiative generated academic, practical, and social outputs. Academically, the program resulted in a scholarly article prepared as a form of dissemination and publication. In practice, the main outputs included professional CVs and cover letters developed, revised, and optimized by participants during the training. These documents were structured to meet professional industry standards, including structural coherence, achievement-based content, ATS compatibility, and communicative visual design.

Additionally, the program contributed to enhancing participants' non-technical competencies, particularly digital literacy, Generative AI utilization skills, and confidence in professional communication. Socially and institutionally, the initiative strengthened collaborative networks among higher education institutions, students, and professional practitioners from both domestic and international contexts. Documentation in the form of activity photographs, training materials, and dissemination media further supported program transparency and sustainability. Collectively, these outputs reflect the integration of academic dissemination, practical skill enhancement, and human resource capacity development. The outcomes are expected to provide sustainable benefits for participants, institutions, and the broader development of Generative AI-based training models within vocational education.

Hybrid learning and AI-assisted training have been widely discussed in previous studies, this community service initiative contributes a contextual and sector-specific implementation model for integrating Generative Artificial Intelligence into vocational career preparation programs. While previous AI-based training activities have often focused on general digital

literacy or the introduction of individual AI tools, the present program integrates multiple Generative AI applications within a structured hybrid training framework that emphasizes career readiness, ATS-oriented career document development, and sector-specific vocational preparation. The contextual focus on railway vocational students further differentiates the program by aligning training materials with the competency demands of the railway industry. Although the model represents an applied adaptation rather than a fundamentally new theoretical framework, it demonstrates a practical approach for utilizing Generative AI technologies within community service initiatives aimed at strengthening vocational students' employability and digital competencies. Therefore, the contribution of this study lies in demonstrating an applied training model that integrates multiple Generative AI tools within a hybrid learning environment to enhance career readiness among railway vocational students.

CONCLUSION

The community service program, implemented through a hybrid training model based on Generative AI, was successfully conducted and demonstrated a positive impact on the career readiness of vocational students in Madiun. The program was specifically designed to address practical challenges faced by students, particularly in preparing professional career documents such as CVs and cover letters aligned with the standards of the national and global railway industry. The evaluation results revealed a significant improvement in participants' understanding, as reflected in the increase in pretest-to-posttest scores. This improvement indicates that the training was effective not only in strengthening conceptual knowledge but also in developing participants' practical skills in utilizing Generative AI technologies. Furthermore, the assessment of participants' practical outputs demonstrated substantial enhancements in the quality of CVs and cover letters. Improvements were observed across multiple aspects, including structural organization, content clarity, competency relevance, ATS optimization, and visual design. The integration of applications such as ChatGPT and Canva supported participants in generating structured, achievement-oriented, and visually appealing documents, while TTS and Duolingo provided complementary benefits in strengthening communication and language competencies.

In addition to cognitive and technical improvements, the training program contributed to enhancing participants' digital literacy and self-confidence in facing increasingly competitive recruitment processes. The positive responses from participants regarding the training materials, hybrid learning approach, and professional mentoring highlight that interactive, technology-based training is highly relevant within the context of vocational education. This program demonstrates that the integration of Generative AI into community service initiatives can serve as an innovative strategy to bridge the gap between academic competencies and labor market demands. Overall, this community service program provides a meaningful contribution to strengthening vocational students' employability, particularly within the railway sector. Future studies are recommended to be conducted sustainably with broader scopes, including digital recruitment simulations, AI-assisted interview preparation, and professional portfolio development. In this regard, community service activities function not only as an implementation of the Tri Dharma of Higher Education but also as a strategic instrument for developing adaptive, competitive, and industry-ready human resources in response to the evolving dynamics of the future workforce.

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