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Empowering High School Students through Digital Marketing Training in the Industry 4.0 Era in Sidoarjo

Pemberdayaan Siswa SMA melalui Pelatihan Pemasaran Digital di Era Industri 4.0 di Sidoarjo

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This article contributes to:

Main Theme Figures

Highlights:
- Targeted Training for Youth Empowerment.
- Hands-On Learning Approach.
- Structured and Sustainable Program Design.
- Significant Improvement in Student Skills.
- Fostering Entrepreneurial Mindset

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Abstract

Mastery of design technology and digital marketing is an essential skill in the Industry 4.0 era, particularly for the younger generation to enhance product development and strengthen entrepreneurial capacity. This community engagement program provided digital marketing training to students from three vocational schools in Sidoarjo Regency: SMK Muhammadiyah 3 Ngoro, SMK Trisakti Sidoarjo, and SMK Krian. The program included the development of training modules, program socialization, intensive sessions, and mentoring. Evaluation results showed an average 30% improvement in students' understanding based on pre-test and post-test scores. More than 70% of participants successfully developed basic product websites, and several student-led digital marketing accounts were launched to promote school-based products. In addition to technical competence, the program fostered entrepreneurial initiatives, including brand creation and independent product promotion strategies. These findings demonstrate that structured, hands-on training not only enhances digital literacy but also cultivates entrepreneurial mindsets, equipping students with sustainable skills to meet the challenges of digital transformation in the Industry 4.0 era.

Keywords: *Digital Marketing Training; Vocational Education; Student Entrepreneurship; Community Engagement*

1. Introduction

The rapid advancement of digital technology has fundamentally reshaped global industrial and market dynamics, creating new demands for workforce readiness in the era of Industry 4.0(Fergina & Fakhraj Jaelani, 2025). In Indonesia, internet penetration reached 78% in 2023, with

more than 210 million active users, while the adoption of digital marketing by businesses has grown by over 60% in the past five years (APJII Indonesia, 2024). Despite this growth, the digital literacy index of Indonesian vocational students remains relatively low, particularly in practical competencies such as content creation, website development, and online product promotion (BPS, 2022).

This situation underscores a significant gap between industry requirements—where digital marketing skills are increasingly essential and the current preparedness of senior high school and vocational students. Many students lack structured exposure to industry practices and systematic training in digital promotion tools, limiting both their entrepreneurial opportunities and their job readiness (M. R. Sanjaya et al., 2025), (Yulina & Rachmawati, 2023). Addressing this skills gap is therefore critical to equipping students with the competencies needed to participate in the digital economy.

This article presents a community engagement initiative designed to strengthen students' digital marketing and web-based promotion skills. By emphasizing hands-on training supported by both quantitative and qualitative evaluation, the program seeks to enhance students' technical proficiency while simultaneously fostering an entrepreneurial mindset aligned with the demands of the Industry 4.0 era.

2. Metodology

2.1. Preparation and Development of Training Modules

This community engagement program employed a practice-based training method supported by both quantitative and qualitative evaluations. The initial stage involved the preparation and development of training modules. A needs assessment was conducted in collaboration with partner institutions senior high schools and vocational schools to ensure alignment between institutional requirements and industry demands (Najwa et al., 2023). Based on the results, the implementation team developed modules integrating theoretical concepts with practical applications. These modules introduced participants to Figma as an interface design platform for developing basic web design prototypes, and to Content Management System (CMS) platforms for implementing integrated digital marketing strategies. The objective was to provide adaptive, practice-oriented learning materials that enhanced participants' technological competencies and entrepreneurial readiness(Subariah et al., 2021).

2.2. Program Socialization

After module development, the program was socialized to partner schools through both face to face and online meetings. The socialization process aimed to ensure that participants and school representatives clearly understood the objectives, training scope, schedule, and evaluation framework. This step was essential in fostering preparedness and commitment to the program's implementation (Rizdqi Akbar Ramadhan et al., 2022).

2.3. Training Implementation and Mentoring

The training was conducted intensively in the design computer laboratory at Universitas Muhammadiyah Sidoarjo using a hands-on learning approach. This method was chosen to enhance participants' technical understanding through direct experience with design software and digital media tools (D. S. Sanjaya et al., 2024). A total of 20 participants attended the training, which was delivered over 8 hours in structured sessions combining theory and practice. During the sessions, participants were guided in creating product designs using CAD software and in developing simple web pages as platforms for digital promotion. Each participant received close assistance from instructors and facilitator assistants to ensure proper understanding and smooth progression through every stage of the training (Herkules et al., 2022). To reinforce learning outcomes, the implementation team also provided additional mentoring sessions and facilitated an online discussion forum outside of official training hours to accommodate questions and support participants' independent practice. The effectiveness of the training was evaluated based on improvements in participants' design and digital marketing skills, which served as the primary criteria for assessing training success.

2.4. Evaluation and Feedback

The evaluation strategy combined quantitative and qualitative methods. Quantitatively, participants completed pre-test and post-test assessments designed to measure improvements in design and digital marketing skills. The data were analyzed by comparing score differentials, with skill improvement serving as the primary indicator of training effectiveness. Qualitatively, evaluation was conducted through questionnaires and focus group discussions (FGDs). The questionnaires captured participants' satisfaction and perceived learning progress, while FGDs generated in-depth feedback on training content, delivery, and relevance. These qualitative insights were used to refine the program design and to ensure that future implementations address the practical needs of participants more effectively (Asmayani & Juhari, 2023).

3. Result and Discussion

The web design and digital marketing training was successfully conducted with active participation from more than 20 students representing three partner schools—SMK Muhammadiyah 3 Ngoro, SMK Trisakti Sidoarjo, and SMK Krian as shown in figure 1 and figure 2. The training combined theoretical input with hands-on practice, focusing on the use of the Figma interface design platform and the development of web pages for promoting school-based products.

Figure 1 illustrates the participants' preparation prior to the start of the training session.

Figure 1. Participants' Enthusiasm during Training Session Preparation

3.1. Quantitative Outcomes

The effectiveness of the program was measured using pre-test and post-test assessments as well as competency achievement indicators. Table 1 presents the average score improvements.

Table 1. Average Pre-test and Post-test Scores

Assessment	Average Score (%)	Score Improvement
Pre-test	52.0	–
Post-test	82.0	+30%

As shown in Table 1, there was an average increase of 30% in participants' test scores, indicating significant improvement in both conceptual understanding and technical application.

Table 2. Competency Achievement of Participants

Competency Area	Achievement (%)
Creating basic product designs (CAD/Figma)	82%
Developing simple promotional web pages	71%
Applying digital promotion strategies	68%

The results indicate that a large majority of participants were able to produce design prototypes and basic promotional websites. Notably, as shown in table 2 more than 70% successfully developed functional web pages featuring product descriptions, images, specifications, and contact information.

3.2. Comparative Analysis with Previous Studies

The findings align with previous community engagement initiatives in vocational education that emphasized practice-based digital training. For instance, Satino et al. (Satino et al., 2023) demonstrated that digital design workshops improved students' creative capacity, while Asmayani and Juhari reported significant skill gains through project-based ICT training. However, this study advances the field by directly integrating web design training with digital marketing strategies, a combination less explored in prior programs. This integration not only enhances technical proficiency but also fosters entrepreneurial awareness, positioning this initiative as a novel contribution to vocational education–based community service (Garcés et al., 2025) (D. S. Sanjaya et al., 2024).

3.3. Implications for Replication and Curriculum Integration

The outcomes suggest strong potential for replication in other vocational and secondary schools. The practice-based approach, supported by blended quantitative and qualitative evaluation, offers a scalable model that can be adapted to varying contexts. Furthermore, the integration of web design and digital marketing is highly relevant for inclusion in entrepreneurship and ICT curriculum, equipping students with skills directly applicable to school-based enterprises and future employment.

3.4. Contribution to Vocational Education–Based Community Engagement

The program contributes to the theoretical development of community service models by demonstrating the effectiveness of practice-oriented, skill-based training in vocational contexts. It highlights how digital competencies can be cultivated not only as technical skills but also as enablers of digital entrepreneurship. This expands the discourse on educationally grounded community engagement by linking vocational training directly with local economic empowerment.

3.5. Additional Observations

Qualitative feedback from participants and teachers confirmed the program's relevance. Many students expressed interest in continuing digital marketing activities independently, including the creation of official school business accounts and digital portfolios. Teachers highlighted the program's potential for integration into school curriculum, particularly in entrepreneurship and information technology subjects. These findings reinforce the value of combining technical training with entrepreneurial orientation to prepare students for the demands of the digital economy.

Figure 2.
Intensive class session

4. Conclusion

The digital marketing training significantly enhanced students' competencies, as reflected by a 30% average increase in post-test scores, with over 80% creating product designs and more than 70% developing functional web pages. Despite limitations such as the short training duration and varied baseline skills, the hands-on approach proved effective in strengthening both technical and entrepreneurial capacities. To sustain impact, the program is recommended for integration into school curriculum, complemented by advanced follow-up training and the formation of school-based digital marketing communities. Furthermore, the model offers strong potential for replication in other schools or regions, providing a scalable framework for vocational education–based community engagement that links digital literacy with entrepreneurial readiness in the context of Industry 4.0.

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