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Enhancing Vocational Students' Competencies through Dialogflow-Based Chatbot Training with Consistent Communication Style for Digital Branding

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Abstract. The rapid adoption of artificial intelligence in digital services has increased the relevance of chatbot technology in customer service and digital branding contexts. However, vocational students often receive training that emphasizes technical functionality without sufficient attention to communication consistency and branding strategy. This community engagement program aimed to enhance vocational students' competencies by integrating Dialogflow-based chatbot development with consistent communication style design to support digital branding. The program employed a practice-oriented training approach consisting of conceptual instruction, hands-on development, and reflective evaluation, involving vocational high school students as participants. The results indicate that participants demonstrated improved understanding of chatbot concepts, acquired foundational technical skills in Dialogflow, and developed greater awareness of communication consistency and brand voice in chatbot interactions. The integration of technical and communicative aspects contributed to more coherent and user-oriented chatbot designs. These findings suggest that community-based training models combining applied artificial intelligence and digital communication strategy can effectively support holistic competency development in vocational education and strengthen students' readiness for contemporary digital service environments.

Keywords: Dialogflow, Chatbot Training, Digital Branding, Communication Style, Vocational Education
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INTRODUCTION

The rapid advancement of digital technologies has fundamentally transformed the way organizations, educational institutions, and businesses interact with users and customers. Digital transformation no longer focuses solely on operational efficiency, but increasingly emphasizes the quality, consistency, and responsiveness of digital communication. In this context, artificial intelligence (AI) has emerged as a key enabler for enhancing digital services, particularly through conversational technologies that facilitate automated yet interactive communication between systems and users [1].

Among various AI-driven communication tools, chatbots have become a prominent solution in modern customer service due to their ability to provide real-time responses, operate continuously without temporal constraints, and handle a high volume of interactions efficiently [2],[3]. Beyond their functional role, chatbots are increasingly expected to deliver engaging and context-aware interactions that resemble human-like conversations[4]. As a result, chatbots are no longer perceived merely as technical tools, but as strategic digital interfaces that shape user experience and influence perceptions of service quality[5],[6].

The evolution of chatbots has been closely associated with advances in Natural Language Processing (NLP), which enable systems to understand user intent and generate appropriate responses[7],[8],[9]. Google Dialogflow is one of the widely adopted NLP-based platforms that supports the development of conversational agents through structured components such as intents, entities, and dialog flows [10]. Its

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relatively intuitive design, combined with robust NLP capabilities, makes Dialogflow particularly suitable for educational settings, allowing learners to acquire practical skills in chatbot development while engaging with technologies commonly used in industry [11],[12].

Nevertheless, the effectiveness of a chatbot is not determined solely by its technical performance. In digital service environments, chatbots also function as communicative representatives of an organization or brand [13]. Inconsistent language style, tone, or response structure may lead to user confusion and reduce trust in the service provided [14]. Therefore, ensuring consistency in communication style, often referred to as brand voice, becomes a critical aspect of chatbot design [15]. Integrating technical chatbot development with an understanding of consistent digital communication is essential, especially in vocational education contexts where learners are prepared to meet real-world industry demands [16].

In the context of vocational education, particularly at the secondary level, the ability to understand and apply emerging digital technologies has become increasingly important [17]. Vocational high schools are expected to equip students with practical competencies that align with current industry needs, including skills in artificial intelligence, digital services, and interactive system development [18]. However, the rapid pace of technological innovation often creates a gap between curricular content and the competencies required in real-world digital environments, especially in applied areas such as conversational AI [19].

This competency gap is particularly evident in chatbot development learning, where students tend to focus primarily on technical implementation without sufficient attention to communication strategy and user experience [20]. While students may successfully create functional chatbots, they often lack an understanding of how conversational design, tone, and consistency influence user perception and brand credibility [21]. As a result, chatbots produced in educational settings may function correctly but fail to deliver meaningful or professional communication that reflects organizational identity [22].

From a digital branding perspective, customer service interactions play a crucial role in shaping brand image and user trust [23]. Inconsistent or poorly designed chatbot communication can undermine branding efforts, even when the underlying technology is reliable. Consequently, integrating branding concepts such as consistent communication style and brand voice into technical chatbot training is essential [24]. This integration enables learners to perceive chatbot development not only as a programming task but also as a strategic communication activity.

Based on these considerations, community service programs conducted by higher education institutions play a strategic role in bridging the gap between academic knowledge and practical industry demands [25]. Through targeted training activities, universities can transfer applied technological knowledge while simultaneously introducing non-technical competencies, such as digital communication and branding awareness [26]. In this regard, community engagement initiatives focused on chatbot development provide an effective platform for empowering vocational students with holistic skills that combine technical proficiency and strategic communication.

Within this framework, vocational students at the partner institution, SMK Negeri 1 Sukoharjo, represent a group with strong potential to develop applied digital competencies but limited exposure to integrated chatbot design practices [27]. Although students are familiar with basic information technology concepts, their experience in developing conversational systems that align technical functionality with branding-oriented communication remains limited. This condition highlights the need for structured training that addresses both technological and communicative dimensions of chatbot development.

The challenges faced by these students are not solely technical in nature. Many learners demonstrate a tendency to prioritize system functionality while overlooking the importance of conversational consistency and user-centered design [28]. This imbalance often results in chatbot outputs that are operational but lack coherence in tone, language, and message structure. Such limitations indicate the necessity of introducing structured guidance on communication style and brand voice as an integral part of chatbot training.

In accordance with the Tri Dharma of Higher Education, universities have a responsibility to contribute to community empowerment through the dissemination of knowledge and technology [29]. Community

service activities serve as a medium for translating academic expertise into practical interventions that address real societal and educational needs. By engaging directly with vocational institutions, universities can support the development of industry-relevant competencies while fostering collaboration between academic and non-academic stakeholders.

Therefore, this community service program was designed to provide hands-on training in chatbot development using Google Dialogflow while simultaneously emphasizing the importance of consistent communication style to support digital branding. The program aims to enhance students' technical skills, improve their awareness of strategic digital communication, and prepare them to develop chatbot solutions that are both functionally effective and communicatively coherent. Through this approach, the program contributes to strengthening vocational education outcomes in the context of contemporary digital service environments.

METHODS

A practice-oriented training approach was adopted to enhance both technical and communicative competencies in chatbot development. The implementation framework was systematically organized into sequential stages, beginning with program planning and participant selection and continuing through material preparation, conceptual introduction, technical training, and evaluation, as illustrated in Figure 1.

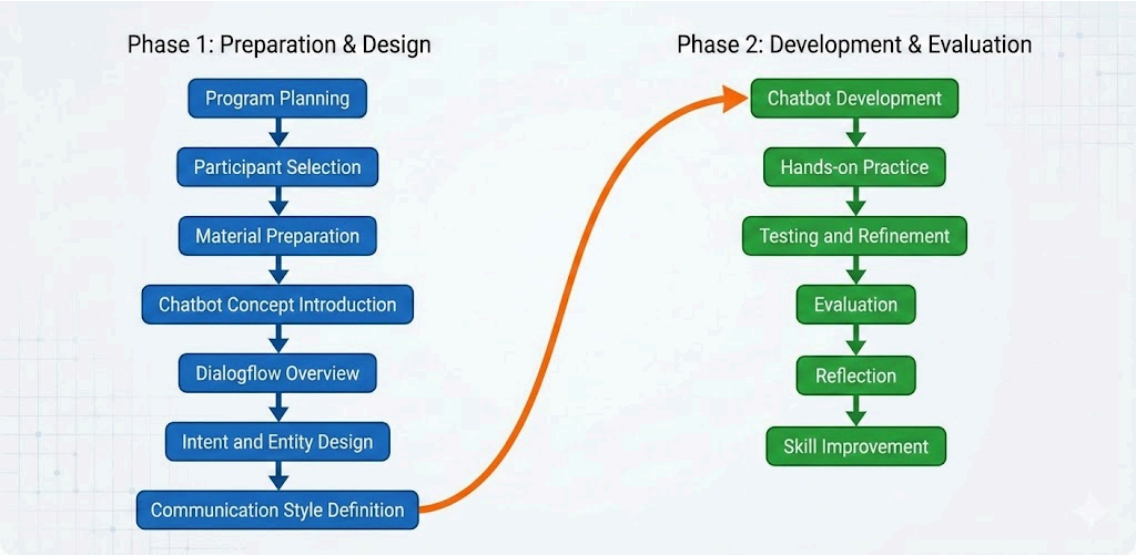

Figure 1. Training flowchart for Dialogflow-based chatbot development with consistent communication style

The flowchart presents a structured progression of activities, including chatbot concept introduction, Dialogflow overview, intent and entity design, communication style definition, hands-on development, testing, refinement, and reflective evaluation. This staged workflow was designed to ensure alignment between learning objectives, instructional processes, and targeted competency improvement.

The participants of the program consisted of vocational high school students from SMK Negeri 1 Sukoharjo, primarily from technology-related study programs. The training was conducted in a computer laboratory environment to provide adequate access to hardware, internet connectivity, and software tools required for chatbot development. Google Dialogflow was chosen as the primary development platform due to its accessibility, industry relevance, and suitability for introducing Natural Language Processing concepts at the vocational education level.

The training materials were delivered in a structured sequence, beginning with an introduction to chatbot concepts and their role in digital customer service. Participants were then guided through the core components of Dialogflow, including the creation of intents, entities, and conversational flows. In parallel, a dedicated session was conducted to introduce the concept of consistent communication style,

where participants were encouraged to define a simple brand voice guideline encompassing language tone, response structure, and communicative consistency before implementing it within their chatbot designs.

During the practical sessions, participants worked individually or in small groups to develop a simple customer service chatbot based on predefined scenarios. Facilitators provided real-time assistance and feedback, particularly in aligning chatbot responses with the established communication style guidelines. This iterative process allowed participants to test, refine, and improve both the functional accuracy and communicative coherence of their chatbots through direct experimentation and peer discussion.

Evaluation of the program was conducted through qualitative observation of participant engagement, assessment of the chatbot outputs, and reflective discussion sessions at the end of the training. The evaluation focused on participants' ability to implement Dialogflow components correctly, maintain consistency in chatbot communication style, and demonstrate an understanding of the relationship between technical design and digital branding. The outcomes of this evaluation served as the basis for analyzing the effectiveness of the training method and identifying areas for future improvement and sustainability of the program.

RESULT AND DISCUSSION

The implementation of the training activities proceeded as planned and involved active participation from vocational high school students of SMK Negeri 1 Sukoharjo. A total of 31 students took part in the program, representing technology-oriented study backgrounds. The structured learning environment enabled participants to engage directly with the Dialogflow platform and apply the training materials in real time. Overall, the staged workflow facilitated a gradual transition from conceptual understanding to applied chatbot development.

From a technical perspective, participants demonstrated a noticeable improvement in their understanding of chatbot fundamentals, particularly regarding the role of conversational agents in digital customer service. Initial observations indicated limited awareness of chatbot functionality beyond basic automation. However, following guided instruction and hands-on practice, students began to conceptualize chatbot interactions as structured dialogues designed to support user experience and service consistency.

The introduction to Google Dialogflow effectively supported participants in acquiring foundational technical skills. Most participants were able to design intents, define entities, and construct basic conversational flows within the training session. This outcome indicates that Dialogflow provides an accessible yet industry-relevant platform for introducing Natural Language Processing concepts in vocational education settings.

Beyond technical skill acquisition, the training also produced meaningful improvements in non-technical competencies related to digital communication and branding. Participants were introduced to the concept of consistent communication style and encouraged to define a simple brand voice guideline prior to chatbot implementation. This approach enabled students to recognize the relationship between technical chatbot responses and their communicative impact on users.

A comparative overview of participants' competencies before and after the training is presented in Table 1. The table summarizes observed improvements across both technical and communicative dimensions, highlighting the added value of integrating branding-oriented communication into chatbot training.

Table 1. Comparison of Participants' Competencies Before and After Training

Aspect Evaluated	Before Training	After Training	Observed Improvement
Understanding of chatbot concepts	Limited awareness of chatbot roles and functions	Clear understanding of chatbot applications in customer service	Conceptual comprehension increased
Dialogflow technical skills	No experience with intents and entities	Able to design intents, entities, and dialog flows	Technical proficiency improved

Conversational structure design	Responses created without structured flow	Responses organized into coherent dialog flows	Interaction logic strengthened
Communication style consistency	Inconsistent tone and language usage	Consistent tone aligned with defined brand voice	Communication coherence improved
Awareness of digital branding	Branding perceived as separate from technology	Branding integrated into chatbot design	Strategic awareness increased

As shown in Table 1, participants demonstrated improvement not only in technical chatbot development skills but also in their ability to design consistent and branding-aligned conversational responses. This finding suggests that chatbot training programs that integrate communication strategy alongside technical instruction are more effective in producing holistic competencies relevant to real-world digital service environments.

Participant engagement during hands-on activities further reinforced these outcomes. Students actively tested and refined their chatbots, experimenting with alternative response structures while maintaining consistency with the predefined communication style. Such engagement indicates that the inclusion of branding considerations enhanced learners' motivation and critical thinking during the development process.

Several implementation challenges were identified, particularly related to time limitations and participants' initial tendency to prioritize functional correctness over communicative coherence. Nevertheless, adaptive facilitation strategies, such as guided templates and real-time feedback, helped mitigate these issues and maintain alignment with learning objectives.

From a community service perspective, these results highlight the effectiveness of higher education–led training initiatives in bridging competency gaps within vocational education. By combining applied AI training with digital communication awareness, the program contributed to strengthening students' readiness to engage with contemporary digital service technologies.

CONCLUSION

This community engagement initiative demonstrates that a practice-oriented training model integrating chatbot technology and communication strategy can effectively enhance vocational students' competencies in digital service development. The results indicate that participants not only acquired foundational technical skills in Dialogflow-based chatbot design but also developed a clearer understanding of the strategic role of communication consistency in shaping user experience and digital branding. The integration of branding-oriented communication into technical chatbot training emerged as a key contribution of this program. By introducing the concept of consistent communication style alongside intent and entity design, the training encouraged participants to perceive chatbots as communicative representatives of an organization rather than purely functional systems. This holistic perspective aligns with current industry expectations, where the effectiveness of AI-based services is increasingly evaluated based on both technical reliability and communicative quality. From an educational and community service perspective, the program highlights the important role of higher education institutions in bridging competency gaps within vocational education. The findings suggest that community-based training initiatives can serve as effective platforms for transferring applied artificial intelligence knowledge while simultaneously fostering non-technical skills that are often underemphasized in formal curricula. Such initiatives contribute to improving students' readiness for industry demands and supporting sustainable digital skill development at the community level. Despite its positive outcomes, the program was limited by time constraints and the scope of chatbot features explored. Future community service activities may benefit from extended training durations, the inclusion of advanced conversational features, and longitudinal evaluation to assess skill retention and real-world application. Nevertheless, the training model presented in this study provides a replicable framework for community engagement programs aiming to integrate applied AI technologies with strategic digital communication and branding awareness.

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