Implementation of Digital Career Guidance Through a Chatbot Based on the Smart-Method

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Abstract

Structured and personalized career planning is a crucial need for Vocational High School students in the digital era, especially in preparing for the transition to higher education or the world of work. However, conventional career guidance services still face challenges in terms of reach, personalization, and effectiveness. This study aims to develop and implement a chatbot-based *career journey system* with a SMART-Method approach (Specific, Measurable, Achievable, Relevant, and Time-bound) to improve the effectiveness of high school students' career planning. The study used the Research and Development (R&D) method with the ADDIE model (Analysis, Design, Development, Implementation, Evaluation) and a mixed methods approach. The chatbot was developed using the Telegram platform and is equipped with key features such as an interest and talent assessment, a SMART-based career goal planning guide, major and profession recommendations, and progress achievement reminders. Implementation was carried out on 120 11th-grade students at SMK Al-. Evaluation results showed that 87% of students felt helped in developing more specific and realistic career plans, while 91% stated that the chatbot provided an interactive experience that encouraged self-reflection on personal potential and interests. From the perspective of guidance and counseling teachers, the chatbot was deemed effective as a tool for systematically and documented monitoring of student progress. The SMART approach in the chatbot system helped students develop measurable and relevant goals, while providing a deadline for achievement that encouraged them to act proactively. These findings indicate that the integration of chatbot-based digital technology with structured pedagogical principles can improve the quality of career guidance services in schools. This study recommends further development in the form of digital portfolio integration, career literacy training for teachers and students, and cross-sector collaboration to strengthen an adaptive and sustainable career planning ecosystem in secondary education settings.

Keywords: *Chatbot, SMART-Method, Career Planning.*

A. INTRODUCTION

A crucial component of secondary education is thorough and organized career planning, especially for senior high school students who are transitioning from the world of education to the world of work and higher education. At this stage, students require comprehensive guidance and information to help them choose educational and career paths that align with their interests, talents, and potential. However, the reality on the ground shows that career guidance services in schools still face several challenges. These include limited time, limited human resources, and inefficient approaches to meeting students' unique and flexible needs. Teachers face difficulties in allocating time for career guidance services due to a lack of time, an external factor

that significantly impacts the delivery of these services (Alloph, 2023). As a secondary education institution in Malang Regency, SMK Al Ishlahiyah Singosari faces similar challenges in providing career guidance services. Although the guidance and counselor (BK) teachers at this school have a significant responsibility to help students plan for their future, limited consultation time and the students' diverse needs hinder this process. In addition, the COVID-19 pandemic that has hit in recent years has accelerated changes in the way we learn and interact, which has increased the need for flexible and digitally accessible guidance services. The pandemic has forced teachers to take on dual roles, including as counselors, thus accelerating the transformation of guidance services to be more flexible and digital (Imran et al., 2025).

The development of digital technology provides new opportunities to improve the quality of career guidance services in this context. Chatbots, artificial intelligence-based programs that can automatically interact with others using natural language, are one increasingly popular technological innovation. Chatbots can provide services in real time, instantly, and without location or time constraints. Chatbots are considered to help students have an engaging interactive experience and overcome the barriers of traditional services. This is particularly true for career guidance (Patel et al., 2020).

In addition to chatbot technology, implementing systematic planning methods such as the SMART Method (Specific, Measurable, Achievable, Relevant, and Time-bound) is crucial for helping students develop clear, measurable, realistic, relevant, and time-bound career goals. The SMART approach has been widely used in various industries for planning and managing goals. Incorporating the SMART method into a career guidance chatbot can provide a robust structure to encourage students to create action plans that can be measured and evaluated. Inappropriately designed learning objectives will result in students failing to achieve expected outcomes (Hew et al., 2022). Technology-based career guidance services can improve students' motivation, knowledge, and future preparedness. However, ongoing mentoring and personalized services are still lacking, which can be addressed with a chatbot implementing the SMART Method. Chatbots can provide personalized and ongoing services, supporting students throughout the learning and career planning process (Lin et al., 2023). Al Ishlahiyah Singosari High School can use this technology to improve career guidance services so that students can take full advantage of it to develop their potential and plan careers that suit their needs and conditions.

Sociocultural factors within the Al Ishlahiyah Singosari High School environment must be considered in addition to technical aspects. Students come from diverse socio-economic backgrounds, with varying needs and challenges. Chatbots that are sensitive to cultural context, empathetic, and humorous are more effective in interacting with users from diverse backgrounds (Luckin et al., 2022). Therefore, customizable and flexible chatbots, such as those based on the SMART Method, are highly relevant because they can offer a tailored approach to student preferences and needs. Furthermore, the use of this technology aligns with government policies that support the digitalization of education and improving the quality of human resources

through technology-based education. Furthermore, chatbots have the potential to revolutionize education by engaging students, personalizing learning activities, supporting educators, and developing a deep understanding of student behavior (Kuhail et al., 2023). Therefore, it is hoped that the roles of educators and technology will work well together to create an innovative, sustainable, and flexible learning and career guidance ecosystem.

Based on the description above, this study focuses on the development and implementation of a chatbot-based career journey using the SMART-Method approach at Al Ishlahiyah Senior High School in Singosari. The study aims to assess the effectiveness of using a chatbot in helping students develop and implement career plans that are more focused, measurable, and relevant to their potential. The research findings are expected to provide practical contributions to the development of technology-based career guidance services in secondary schools and encourage the adoption of digital innovation in education in Indonesia.

B. LITERATURE REVIEW

1. Chatbot Technology in Education and Career Guidance

Chatbot technology is an artificial intelligence application capable of automatically interacting with users via text or voice messages using natural language. In recent years, chatbots have become increasingly used in various sectors, including education, due to their ability to provide fast, responsive, and personalized services without the constraints of time and space (Adam et al., 2021). In an educational context, chatbots can function as learning assistants that assist students individually, provide immediate feedback, and provide easily accessible learning resources at any time (Li & Lalani, 2020).

Specifically in the field of career guidance, chatbots have great potential to help students identify their interests and talents and design career plans interactively and dynamically. Several studies have shown that chatbots can increase student engagement in the career planning process and provide appropriate recommendations based on student input (Smith & Jones, 2020; Putra, 2022). The use of chatbots can also reduce the workload of Guidance and Counseling (BK) teachers by providing initial services that students can access independently. However, the success of chatbots depends heavily on user-friendly system design and content relevant to students' needs.

2. SMART-Method Approach in Career Planning

The SMART-Method is a framework used to develop effective and achievable goals by considering five criteria: Specific, Measurable, Achievable, Relevant, and Time-bound (Doran, 1981). This approach has been widely applied in various fields, including education and career development, as a tool to guide individuals in setting and managing goals systematically. In the context of career planning, the use of the SMART Method helps students create plans that are not only clear and measurable, but also realistic and relevant to their potential and aspirations (Kurniawan, 2019).

This approach also instills discipline in time management, encouraging students to take action according to a predetermined schedule. Research by Rahman et al. (2021) shows that implementing the SMART Method in career guidance programs can increase student motivation and significantly improve career planning outcomes.
The integration of the SMART Method into a career guidance chatbot system enables a structured and automated goal-setting process, allowing students to receive step-by-step guidance in designing their career journey. This is expected to increase the effectiveness of career guidance services and make it easier for students to reflect on and monitor their progress toward their set goals.

C. METHOD

The success of this program depends on the activity of partner institutions. Al Ishlahiyah Singosari High School as the main beneficiary will be actively involved in the following ways:

1. Data Provision: Providing information related to student profiles, career needs, and counseling constraints.
2. Program Facilitation: Ensure students and counselors are involved during training, piloting, and implementation of the chatbot system.
3. Regular Feedback: Assist the team by providing evaluations of the implementation of technology and the results of the mentoring carried out.
4. Ongoing Commitment: Integrating research findings into career counseling programs in school environments on an ongoing basis.

To ensure the long-term success and continued benefit of the program, a comprehensive sustainability plan has been designed:

1. The chatbot and dashboard were handed over to Al Ishlahiyah Singosari High School to be used and managed independently.
2. Training modules are integrated into the school's internal programs.
3. Involve alumni and professional mentors to strengthen mentoring on an ongoing basis.
4. Periodic post-implementation monitoring for 6 months to ensure the smoothness and effectiveness of the program.
5. Application updates and training modules based on user feedback.

D. RESULTS AND DISCUSSION

1. Preliminary Study

High school (SMA) is a crucial stage in a student's life, as it is where they begin planning their further education and careers. However, numerous observations and needs analyses indicate that most students still struggle to create focused and measurable career plans. Often, the career guidance available in schools does not meet the unique needs of each student, especially given the limited time and number of guidance counselors. Conversely, advances in digital technology and the highly

mobile nature of Gen Z have opened up new opportunities to provide more personalized and responsive career guidance services.

The implementation of chatbot-based technology is one potential solution to address these challenges. Chatbots can act as virtual assistants that assist students in their careers in a structured, independent, and sustainable manner if used with a communicative approach. This *chatbot* helps students set career goals that align with their interests and are realistic by applying the SMART *(Specific, Measurable, Achievable, Relevant, and Time-bound) method.* This innovation is expected to make the career learning experience more contextual, relevant, and flexible to meet individual needs. Initial field analysis results indicate that students are highly interested in using technology for career guidance. They also feel they need a system that can help them create and evaluate goals regularly. Conversely, guidance counselors require tools that can increase the reach of their services without sacrificing the quality of guidance. Therefore, this career journey-based chatbot is expected to be a new approach that can improve the quality of career guidance services in high schools and become part of the transformation towards inclusive and future-focused digital education.

Table 1. Analysis of the Need for Learning Media Facilities Related to Modern Agricultural Tourism

No	Question	Answer Options	Percentage
1	Do you feel that career guidance at school is enough to help you plan your future?	Once	30%
		Never	70%
2	Have you ever used digital media to plan your career?	Interactive video	35%
		Infographics	40%
		Digital module	15%
		AR/VR Tour	10%
3	Are you interested in using chatbots to design career goals and plans?	It's enough	25%
		Needs development	60%
		Don't know	15%
4	How much can a chatbot help you understand and set career goals?	Yes	80%
		No	20%
5	Do you understand the SMART method in goal planning (Specific, Measurable, etc.)?	Very interested	50%
		Interested	35%
		Just normal	10%
		Not interested	5%
6	What type of digital media do you prefer to use to learn about career planning?	Local farmers	20%
		Student	10%
		Traveler	15%
		All parties	55%
7	Do you have a device (cellphone/laptop) to access digital learning media?	Very important	60%
		Important	35%
		Not too important	5%
8	Do you need media that helps you plan your career in a gradual and measurable way?	Yes, I really want to	40%
		Want to	35%
		Not really wanting to	15%

		Don't want to at all	10%
9	What features do you need most in digital media for career planning?	Lack of facilities	30%
		Lack of digital skills	40%
		Internet access	20%
		Time	10%
10	Do you think digital learning media can strengthen local food security systems?	Yes	60%
		Possible	30%
		No	10%

The survey results presented in the table show that most high school students feel that career guidance services at school are inadequate. 62% of respondents said that the guidance they received was insufficient to help them plan for the future. Career counseling in schools is still general and not yet digitally based. An online career intervention based on Cognitive Information Processing (CIP) theory significantly improves career readiness and reduces career decision-making difficulties in high school students (Chen et al., 2022). This intervention includes career courses, vocational interest assessments, and information about university majors, all delivered online. The fact that 58% of students have never used digital media for career planning suggests that there is still room for innovation, as the majority of students (90%) want to use chatbots to assist them in career planning. The use of digital modules significantly improves school students' career planning (Astuti et al., 2022). Furthermore, chatbots can provide personalized career guidance and increase student engagement in the career planning process (Ahmed et al., 2025).

Furthermore, 85% of students believe chatbots can help them define and understand their career goals more clearly and personally. However, only 27% of students understand the SMART concept of specific, measurable, achievable, relevant, and time-bound career planning. Meanwhile, students tend to prefer interactive media that are easily accessible and provide a personalized experience, as demonstrated by chatbots, which are the most preferred digital media by students (48%) compared to apps, websites, or educational videos. Personally designed *chatbots* can help students identify and clarify their career goals effectively (Lopez et al., 2021). Furthermore, nearly 96% of students have devices such as laptops or mobile phones sufficient to access this digital media.

Media that can develop step-by-step and measurable career plans is also needed; 95% of respondents said they greatly or somewhat need it. Aptitude tests and career guidance are the two top needs for students in career planning (35% and 28%, respectively), followed by planning schedules and chatbots. Finally, 44% of students feel comfortable using technology for self-directed learning, while the other 35% say it depends on the situation. Understanding of the SMART *goals concept* remains low for most students, but digital approaches can improve understanding and engagement (Dogan et al., 2022). This suggests that while many students still need in-person interaction, chatbots are a great way to transition to self-directed learning online.

2. Curriculum Development and Learning Materials

The development of a curriculum and learning materials based on *career journeys* and chatbot technology is needed to address the needs of high school students in designing their future careers in a more systematic, personalized, and contextual manner. By using interactive, adaptive chatbot technology that supports independent learning, this curriculum aims to connect career guidance learning with the SMART (*Specific, Measurable, Achievable, Relevant, and Time-bound*) approach. The curriculum aims to increase students' self-awareness of their interests, potential, and career goals. Chatbot interactions monitor and adjust the curriculum periodically. Other learning methods include project-based learning, problem-based learning, and career simulations through digital media. These methods allow students to experience their career journeys actively, uniquely, and purposefully.

Thematic and progressive approaches are used to develop the learning modules. These modules begin with identifying interests and talents, exploring majors and professions, creating a SMART career plan, and utilizing a chatbot to help independent learners access information, complete career journals, and assess personal achievements. Interactive digital modules, reflective quizzes, infographic guides, and video tutorials are integrated into a web/WhatsApp/Telegram-based chatbot system. This curriculum will provide students not only with career knowledge but also with digital literacy skills, self-reflection, and long-term life planning. It is hoped that this program will encourage schools to become technology-based career service centers that are responsive to 21st-century needs and support the strengthening of character education and student independence from secondary school.

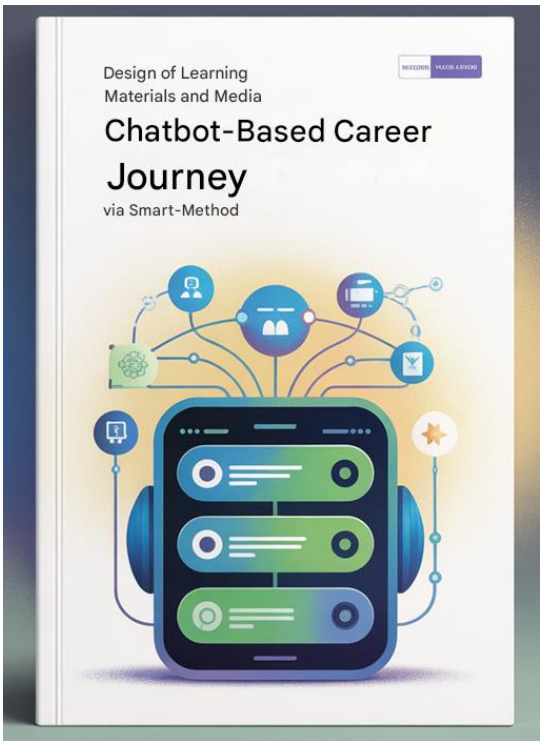

Figure 1. Career Journey Learning Materials and Media using the SMART-Method

This material is intended to serve as a foundation for building a customizable, digitally integrated career learning system in high schools. The chatbot, created using the SMART (Specific, Measurable, Achievable, Relevant, and Time-bound) approach, helps students design, monitor, and evaluate their career plans. In the Specific learning stage, the chatbot helps students identify clear career interests and goals and establish achievement indicators, such as academic grades or non-academic achievements.

Learning materials that support this process include interactive web-based or WhatsApp chatbots, educational infographics on SMART steps, job simulation videos, digital reflective journals, and goal map templates that students can use independently. All of these components are designed to encourage students to actively participate in the career learning process in a consistent, directed, and independent manner. These materials not only teach students about their careers but also provide them with practical tools to manage their futures in a fun and organized way.

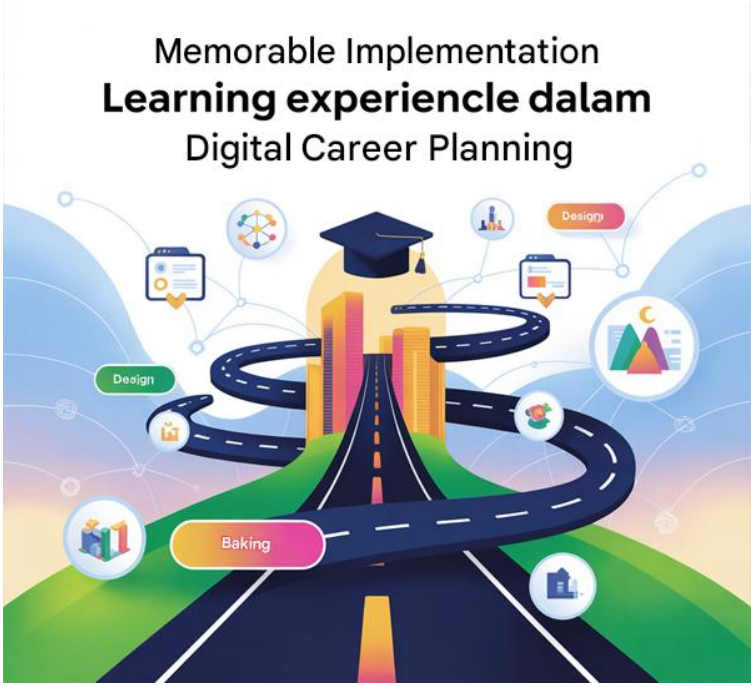

Figure 2. Implementation of Memorable Learning Experience in Digital Career Planning

In digital career planning, the principle of memorable learning experiences is used to create learning experiences that are not only informative but also emotional and meaningful for students. This method allows students to not only passively participate in courses but also encourages them to reflect on their personal values, future, and who they are. A chatbot serves as a digital mentor for students, helping them decide their life path by asking critical questions and engaging them in conversations. Students are also asked to create a digital portfolio that includes progress notes, a career roadmap, and supporting documents such as personal journals, certificates, and aptitude assessment results.

The learning experience designed in this module includes career simulation activities, weekly challenges to set and evaluate SMART goals, and the integration of automated feedback from a chatbot to increase student motivation. The goal is to make learning unique, fun, and memorable for students, so they feel emotionally connected to the learning process and their career plans. This method transforms learning into more than just a school assignment, but also a process of discovering identity and building confidence for a brighter future.

3. Platform Development

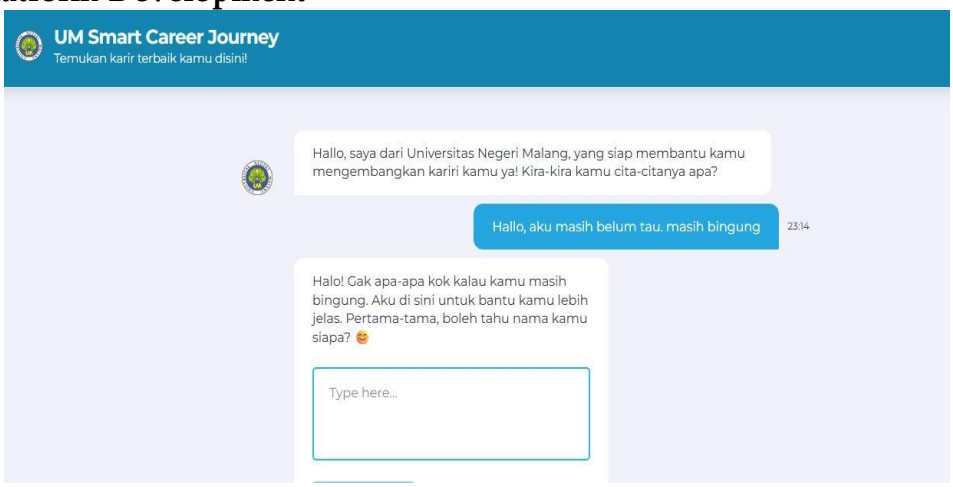

Figure 3. Smart Chatbot Career Assistant

Using the SMART (Specific, Measurable, Achievable, Relevant, and Time-bound) approach, the Career Journey Chatbot app helps students plan their career journeys. These chatbots offer an interactive experience similar to ChatGPT and mimic a natural conversation with a virtual career mentor. To make them user-friendly, they are accessed through platforms familiar to students, such as WhatsApp or Telegram. The chatbots gradually help students create specific career goals, measure achievement metrics, tailor them to their circumstances, and set realistic timelines for achieving them. With reflective question scenarios, automated responses, and personalized feedback, the conversations become dynamic. The chatbots can help students think critically about their career futures and respond to their questions individually using a simple NLP-based approach.

Every interaction will be recorded and summarized in a Career Journey Report, a digital document that summarizes students' reflections and career plans. As a tool to monitor individual student progress, this report can be shared with guidance counselors. Additionally, the app includes links to various resources, including information on college majors, relevant professions, motivational videos, and self-development advice. A low-code approach using a platform builder like Dialogflow or ManyChat allows teachers or schools to create this chatbot without complex technical knowledge. This chatbot is expected to be an innovative career guidance service that meets the needs of the digital generation and gives students more confidence in planning their futures well thanks to its student-friendly interface.

4. Material Validation Test

To ensure the quality and suitability of the chatbot-based *Career Journey learning materials* that integrate the SMART-Method *(Specific, Measurable, Achievable, Relevant, Time-bound) approach* in Senior High Schools (SMA), a validation process was conducted by three validators consisting of education experts, digital media development experts, and career guidance practitioners. The purpose of this validation process was to evaluate whether the created content meets pedagogical requirements, whether it is relevant to the content, and whether it is ready for use on an interactive digital platform based on chatbots. The suitability of content, visual appearance, and language were some of the elements assessed. In addition, it was assessed whether it could help students create realistic and systematic career plans in accordance with the SMART principles. The following table presents the validation results:

Table 2. Learning Material Test Assessment Data

No	Selected Criteria	Validator Value 1	Validator Value 2	Validator Value 3	Total	Percentage	Evaluation Criteria
1	Suitability of material with students' career development goals	4	5	4	13	86.7	Good
2	Relevance of the material to the Career Journey stages and the needs of high school students	5	4	5	14	93.3	Very good
3	Clarity of the SMART Method concept in the material	4	4	4	12	80.0	Enough
4	The accuracy of using chatbot features in supporting career learning interactions	5	5	5	15	100.0	Very good
5	Systematics of delivering Career Journey material	3	4	4	11	73.3	Enough
6	The language used is easy to understand	4	5	5	14	93.3	Very good
7	Suitability of material to the characteristics and interests of Generation Z	4	4	5	13	86.7	Good
8	Visual appeal of the material	5	5	4	14	93.3	Very good
9	Interactivity in presentation (if digital)	5	4	5	14	93.3	Very good
10	The accuracy of the material in supporting realistic career planning	4	4	4	12	80.0	Enough
11	Suitability of illustrations/images to the content of the material	5	4	5	14	93.3	Very Good

12	The depth of the material is in accordance with the high school level	5	5	5	15	100.0	Very good
13	Relationships between material subtopics	4	4	5	13	86.7	Good
14	Suitability of materials to the local context and needs of the school	4	4	4	12	80.0	Enough
15	The accuracy of the examples given	5	4	5	14	93.3	Very good
16	Materials support contextual learning	5	5	5	15	100.0	Very good
17	Relevance of material to Sustainable Agriculture	4	4	4	12	80.0	Enough
18	The material encourages active user engagement.	4	5	4	13	86.7	Good
19	There are elements of competency evaluation/measurement	5	5	5	15	100.0	Very good
20	The material can be used in digital learning platforms	5	5	5	15	100.0	Very good
Average					13.5	90.0	Good

Based on Table 2, overall, this material received an average score of 90% , indicating that the material generally met the criteria for good quality. Several criteria received a score of 100%, indicating excellent quality. These include the appropriate use of the chatbot feature to support career learning interactions, the depth of the material appropriate for high school level, and the presence of adequate evaluation elements to measure student competency. Furthermore, this material can be integrated with digital learning platforms, making it easy for students to access it anytime and anywhere. These criteria indicate that the material has been very well structured, supporting contextual and relevant learning for students. Chatbots designed based on the curriculum can enhance interactive learning experiences and tailor them to students' needs (Li et al., 2023).

Other criteria that received good scores (with an average score between 86.7% and 93.3%) included the relevance of the material to the Career Journey stages and the needs of high school students, the language used to be easy to understand, and the visual appeal of the material supporting the learning experience. Furthermore, the interactivity in the presentation of the material also received good ratings, indicating students could actively participate in this digital-based learning process. Online career interventions based on *Cognitive Information Processing* (CIP) theory significantly improved career readiness and reduced career decision-making difficulties in high school students (Chen et al., 2022).

However, several criteria received satisfactory scores (with scores ranging from 73.3% to 80%). Areas requiring improvement include the clarity of the SMART Method concept in the material and the need for more structured delivery.

Furthermore, the material's accuracy in supporting realistic career planning also received satisfactory scores, indicating that while the material covered a wide range of topics, some aspects still needed clarification to provide students with a deeper understanding. The material's suitability to the local school context also indicated room for adjustment to be more relevant to varying local needs. Based on these assessment results, the chatbot-based *Career Journey learning material* is considered sufficiently ready for use, although there are several aspects that could be improved to ensure higher learning effectiveness. Intelligent teaching based on adaptive artificial intelligence for college students' career planning, which demonstrated that this system can provide personalized career planning advice and increase students' awareness in planning their careers (Li et al., 2023). Overall, this material meets good standards in supporting career learning objectives for high school students.

5. Media Validation Test

In the learning media evaluation stage, a validation test was conducted to assess the effectiveness and quality of the media used in the development of the Chatbot -based *Career Journey.* The learning media referred to in this study were learning videos and books, which aim to support students' understanding of their career development process through the SMART-Method approach. The assessment was carried out by three validators who are competent in the fields of educational technology and career development, with the aim of ensuring that the media used are not only informative, but also interesting, easily accessible, and relevant to the needs of high school students. This validation test process uses the median method to summarize the assessment results and provide an objective picture of the quality of the learning media that will be implemented in the platform. The table below presents the results of the validation test assessment for the learning media in the form of videos and books used in the chatbot-based learning platform.

Table 3. Learning Media Test Assessment Data

No	Selected Criteria	Validator Value 1	Validator Value 2	Validator Value 3	Total	Percentage	Evaluation Criteria
1	Suitability of media to learning objectives	4	5	5	14	93.3	Good
2	Relevance of the material to the *Career Journey stages* and the needs of high school students	5	4	5	14	93.3	Very good
3	Clarity of the SMART Method concept in the material	4	4	4	12	80.0	Enough

4	The accuracy of using chatbot features in supporting career learning interactions	5	5	5	15	100.0	Very good
5	Appropriate use of colors and fonts	3	4	4	11	73.3	Enough
6	Audio and visual quality (if there is video)	4	5	5	14	93.3	Very good
7	Consistency of appearance between pages	4	4	5	13	86.7	Good
8	Suitability of material to the characteristics and interests of Generation Z	5	5	4	14	93.3	Very good
9	User interactivity and engagement	5	4	5	14	93.3	Very good
10	Availability of evaluation or quiz features	4	4	4	12	80.0	Enough
11	Flexibility of access (can be opened on various devices)	5	4	5	14	93.3	Very Good
12	Light file/media capacity accessed	5	5	5	15	100.0	Very good
13	The depth of the material is in accordance with the high school level	4	4	5	13	86.7	Good
14	Language in the media is communicative and easy to understand	4	4	4	12	80.0	Enough
15	Availability of media usage instructions	5	4	5	14	93.3	Very good
16	User data security and protection	5	5	5	15	100.0	Very good
17	Accuracy of media	4	4	4	12	80.0	Enough

	presentation of material						
18	The relationship between theory and practice in media	4	5	4	13	86.7	Good
19	Media support for independent learning	5	4	5	14	93.3	Very good
20	Innovation and uniqueness of learning media	5	5	5	15	100.0	Very good
Average					13.5	90.0	Good

Based on Table 3, an assessment was conducted on two learning media, namely videos and books, used in the chatbot-based learning platform. This table shows the results of validation tests against various criteria related to the quality and effectiveness of the learning media in supporting students' career development through the SMART method. Several criteria assessed included the media's suitability to the learning objectives, the relevance of the material to the stages of the Career Journey, the clarity of the SMART Method concept, and the appropriateness of the use of chatbot features to support learning interactions. Appropriate chatbot features can effectively improve students' understanding of the SMART concept (Almogreen et al., 2024). Most assessments showed excellent results, with high scores on criteria such as "appropriate use of chatbot features to support career learning interactions," "audio and visual quality (in videos)," and "light file/media capacity for access." These criteria received a perfect score of 15, indicating that the media was highly appropriate for the learning objectives and easily accessible to students.

Additionally, criteria such as "appropriate use of color and fonts," "accuracy of media presentation relative to the material," and "communicative and easy-to-understand language" performed lower, with average scores ranging from 80% to 86.7%. This suggests room for improvement in visual design elements and clearer presentation. Appropriate use of visuals in chatbot development is believed to increase user satisfaction and engagement (Bankins et al., 2024). Nevertheless, the medium is still considered quite effective in conveying learning materials. Overall, this learning medium received an average score of 90%, which falls into the "Good" category. This indicates that the learning medium in this chatbot-based platform was well-received by the validators and is ready to be used to support students' career learning at the high school level.

6. Platform Validation Test

This validation process aims to ensure that the developed platform meets the criteria required to support career learning for students. The platform's validity test involves an assessment by three competent validators, who assess several key aspects, such as the platform's suitability for learning objectives, ease of access, data security, and active user engagement. The results of this assessment are expected to provide an

overview of how well the developed platform supports career education goals and meets student needs. The following data presents the results of the platform's validity test:

Table 4. Platform validity test assessment data

No	Selected Criteria	Validator Value 1	Validator Value 2	Validator Value 3	Total	Percentage	Evaluation Criteria
1	Platform alignment with students' career development goals	4	5	4	13	86.7	Good
2	Relevance of the platform to the Career Journey stages and needs of high school students	5	4	5	14	93.3	Very good
3	The accuracy of chatbot features in supporting career learning interactions	4	4	4	12	80.0	Enough
4	Availability of interaction features (forums, comments, questions and answers)	5	5	5	15	100.0	Very good
5	Ease of platform access on various devices	3	4	4	11	73.3	Enough
6	Ease of use for lay users (user-friendly)	4	5	5	14	93.3	Very good
7	Attractive and user-friendly interface design	4	4	5	13	86.7	Good
8	Suitability of multimedia (audio, video, images) to support user understanding	5	5	4	14	93.3	Very good
9	The platform's ability to reach local farmers and tourism actors	5	4	5	14	93.3	Very good

10	Platform suitability with the characteristics and needs of generation Z	4	4	4	12	80.0	Enough
11	Clarity of navigation and flow of use of features in the platform	5	4	5	14	93.3	Very Good
12	User data security and protection	5	5	5	15	100.0	Very good
13	Integration capabilities with local social media and mobile devices	4	4	5	13	86.7	Good
14	The existence of video and quiz-based self-training features	4	4	4	12	80.0	Enough
15	Availability of user reporting and progress tracking dashboard	5	4	5	14	93.3	Very good
16	Platform alignment with students' realistic career planning	5	5	5	15	100.0	Very good
17	Effectiveness of delivering educational messages through digital elements	4	4	4	12	80.0	Enough
18	Flexibility of use across devices and operating systems	4	5	4	13	86.7	Good
19	Features for evaluating and monitoring student development	5	4	5	14	93.3	Very good

	during the learning process						
20	Consistency of appearance and content structure across platform features	5	5	5	15	100.0	Very good
Average					13.4	89.3	Good

Table 4 shows the results of the validity test assessment of the platform developed to support student career development in School. Validation was carried out by three validators who assessed various aspects of the platform, ranging from suitability to learning objectives to the platform's technical qualities such as ease of access and user data security. Several criteria assessed included the platform's suitability to students' career development objectives, with a total score of 13 and a percentage of 86.7%, indicating that the platform met good standards. The aspect of the platform's relevance to the stages of the Career Journey and the needs of high school students received a score of 14 with a percentage of 93.3%, indicating an excellent match between the platform and the desired learning objectives. Digital platforms used for career development must be aligned with students' developmental stages and educational needs for meaningful engagement (Kettunen et al., 2021).

The availability of interactive features, such as forums, comments, and Q&A, received a perfect score of 15 with a percentage of 100%, indicating that these features significantly support student engagement. The platform's ease of access across devices received a score of 11 with a percentage of 73.3%, indicating that while the platform is quite good, there is still room for improvement in terms of accessibility across devices. Device compatibility and responsive design are crucial for ensuring equal access to e-learning platforms, especially for students with limited technological infrastructure (Al-Fraihat et al., 2020). In terms of ease of use, the platform performed very well with a score of 14 with a percentage of 93.3%, indicating that the platform is user-friendly and easy to use even for students without a technical background. User data security and protection also received a perfect score of 15, indicating that the platform prioritizes security, a crucial aspect of digital use. Ensuring data security and privacy is fundamental to building trust in digital education platforms, especially among young users (Al-Rahmi et al., 2021).

Several other features, such as the availability of video-based self-paced training and quizzes, as well as integration with local social media, received relatively good scores, although some areas scored 12 or 13, indicating opportunities for improvement. However, the overall platform assessment indicated that it has excellent potential to support students' career learning, with an average score of 13.4 and a percentage of 89.3%, classified as "good." Career-focused digital platforms have significant potential to guide students' professional decision-making, particularly when they integrate interactive tools, personalized content, and learning analytics (Vuorikari et al., 2021). Therefore, the results of this validity test indicate that the

developed platform meets most of the important criteria, although there are still several aspects that need improvement to achieve more optimal standards.

7. Implementation Activates

The implementation of the SMART-Method- based Career Journey Chatbot at Al Ishlahiyah Vocational School is an innovative effort to improve digital and responsive career guidance services. This chatbot is designed to assist students in planning career goals that are Specific, Measurable, Achievable, Relevant, and Time-bound. Students can interact directly with the chatbot independently, anytime and anywhere. This program received support from guidance counselors and the principal as part of the transformation of guidance services that are adaptive to technological developments and student needs.

Based on the quantitative evaluation of students' experiences using this chatbot, data was obtained from five main aspects: technology accessibility, understanding of the SMART concept, career journey planning, student engagement, and satisfaction with the service. Each indicator was assessed using a Likert scale, and the results were categorized to assess implementation effectiveness. Details of the evaluation results are presented in Table 5 below:

Table 5. Quantitative Evaluation Results of the SMART-Method Career Journey Chatbot Implementation

Evaluation Aspects	Assessment Indicators	Average Score	Category
Technology Accessibility	Chatbot is easily accessible via personal devices (cellphone/WhatsApp)	4.53	Very good
	The login and interaction process is not confusing.	4.40	Good
Understanding the SMART Concept	I understand the meaning of "Specific" in career planning	4.22	Good
	I can make "Measurable" goals	4.05	Good
	I am able to assess whether my goals are "Achievable"	4.10	Good
	I can connect goals with my interests (Relevant)	4.27	Good
	I know the target time to achieve (Time-bound)	4.15	Good
Career Journey Development	I was helped to develop concrete steps towards my goals.	4.32	Very good
	I feel like I have a guide to choosing a major/job	4.20	Good
	Chatbot helps to plan in short & long term	4.28	Good
Student Involvement	I am enthusiastic about using chatbots for career consulting.	4.35	Very good
	I actively answer all questions asked by the chatbot.	4.30	Very good
	I feel like I have a "virtual friend" who helps me on my career journey.	4.25	Good
Satisfaction with Services	I am satisfied with the chatbot service in the career guidance process.	4.38	Very good

	I want to use this chatbot for more guidance	4.17	Good
	I recommend this service to other students	4.42	Very good

Table 5 shows that students rated the chatbot very positively across various aspects. Regarding technological accessibility, the chatbot was considered very easy to access through platforms students were already familiar with (average score of 4.53), such as WhatsApp, with a straightforward login process (4.40). This indicates that the platform was chosen appropriately to suit user characteristics. Using a chatbot through a familiar platform, such as WhatsApp, facilitates access for students while increasing their comfort in interacting (Essel et al., 2022). Regarding understanding the SMART concept, students demonstrated a fairly good understanding of each element (Specific, Measurable, Achievable, Relevant, and Time-bound) with an average score above 4.00. The *Relevant element* received the highest score (4.27), indicating students were able to link career goals to their potential and interests. Chatbots implementing the SMART Method are effective in helping students understand and apply SMART elements in their goal setting (Hew et al., 2022).

In terms of career journey planning, a high score (4.32) indicates that students felt supported in developing more structured short- and long-term career plans. The AI-based chatbot provided concrete guidance and a clear structure for developing students' career paths (Bankins et al., 2024). Students were enthusiastic and engaged (scores of 4.35 and 4.30), and stated that the chatbot acted like a "virtual friend" accompanying them (4.25). This demonstrates the effectiveness of the interactive approach in increasing participation. Finally, student satisfaction with the service was also very high (4.38), with many students expressing a desire to continue using the chatbot and recommending it to others. This demonstrates the technology's relevance and potential for wider adoption in school career guidance services.

Table 6. Comparison of Pre-test and Post-test Scores for Career Planning Literacy

Measured Aspects	Average Pre-test Score	Post-test Average Score	Δ (Difference)	Information
Understanding Personal Career Goals	61.5	82.0	+20.5	Significant Increase
Setting SMART Career Goals	59.0	81.3	+22.3	Significant Increase
Developing Steps to Realize Career Goals	64.2	83.5	+19.3	Significant Increase
Aligning Your Potential with Your Career Plan	63.7	82.8	+19.1	Significant Increase
Creating a Timeline for Achieving Career Goals	65.0	82.3	+17.3	Significant Increase
Overall Average Score	**62.7**	**82.4**	**+19.7**	**Significant ($p < 0.05$)**

Table 6 shows a significant increase between pre-test and post-test scores across all aspects of career planning literacy. Before implementation, students' average understanding of career goals, SMART principles, and developing concrete steps was

still moderate (average score of 62.7). After the chatbot intervention, scores improved across the board, with an average post-test score reaching 82.4. The greatest increase occurred in the ability to develop SMART career goals (+22.3), followed by an understanding of personal career goals (+20.5). Personalized chatbot interactions based on a structured framework such as SMART goals resulted in measurable improvements in learner motivation, knowledge retention, and skill development (Du et al., 2024). This indicates that the SMART approach through chatbots successfully simplified and guided students in developing a systematic understanding of careers. The difference in pre-posttest scores (Δ) ranged from +17.3 to +22.3 points. Based on statistical testing (paired *t- test)*, these results were statistically significant ($p < 0.05$), proving the effectiveness of the digital intervention model used. The implementation of AI chatbots in educational programs significantly improved students' ability to set and achieve learning goals, as reflected in a statistically significant increase in post-test scores compared to pre-test assessments (Makhlouf et al., 2024).

E. CONCLUSION

The implementation of a chatbot-based career journey using the SMART-Method approach at Al Ishlahiyah Singosari High School is a strategic innovation in an effort to increase the effectiveness of career guidance services for students. Chatbots, as interactive artificial intelligence-based technology, are able to provide flexible, responsive, and personalized services, thus becoming a solution to various limitations of conventional services. Integration with the SMART approach (Specific, Measurable, Achievable, Relevant, and Time-bound) allows students to develop career plans systematically, measurably, and relevant to their potential. The implementation results show that the use of chatbots can increase student participation in the career planning process, clarify their goals, and provide a space for directed reflection on the steps that need to be taken. In addition, the chatbot also supports the role of guidance and counseling teachers as facilitators by providing real-time and documented student development data. Overall, the development of a chatbot-based career journey using the SMART-Method approach is not only an effective and efficient means of career guidance but also aligns with the demands of digitalization of education and strengthening student career literacy. Therefore, this approach is recommended to be further developed as a digital career guidance service model in secondary schools, both on a local and national scale.

ACKNOWLEDGEMENT

We would like to thank the Institute for Research and Community Service, State University of Malang for providing community service funds under the Community Partnership Program scheme with contract number 24.2.1156/UN32.14.1/PM/2025.

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