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Autonomous Learning Through Chatbot-based Application Utilization to Enhance Basic Japanese Competence of Vocational High School Students

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Abstract: This study sought to examine vocational students' evaluation and feedback regarding the chatbot-based application as an assistive technology in learning basic Japanese in vocational high school and investigate students' recommendations on the possible future advancement of the chatbot-based application to help students learn the Japanese language better. This study employed a questionnaire and follow-up interview to collect the data, which questionnaire was administered to 100 vocational students enrolled in 8 state vocational high schools located in different regions in Indonesia. The data collected were analysed using SPSS 24, and also tested for reliability and validity. The findings of this study denote the use of the chatbot-based application, namely Gengobot, useful in enhancing students' basic Japanese grammar learning, improving vocabulary mastery related to vocational terminologies, providing practices for basic Japanese language level exercise, having attractive and interactive features, and fostering learners' autonomy and independence learning due to its practicality, portability, accessibility, and flexibility. The results also conveyed the practicality problems and confusion in using the application as an application integrated into social media. Hence, further development of the chatbot-based application Gengobot as assistive technology in learning Japanese is recommended. All in all, the chatbot-based application Gengobot as an assistive Japanese language learning application can be concluded as compelling, and is recommended to be used for vocational students to enhance autonomous learning as well as to support distance learning.

Keywords: Chatbot, Gengobot, social media, language learning, Japanese, vocational education, autonomous learning

1. Introduction

Technical and vocational education (TVE) is a key factor in the development of a country (Rahman, Rozali, Samah, Abu Bakar, Ahmad, Gerijih, & Zakariah, 2022; Dahar, Ruhizan, Kamalularifin, & Khair, 2013), and competency-based learning should be prioritized in the Technical and Vocational Education (TVE) teaching and learning process (Watson, 2007). In line with these suggestions, vocational education in Indonesia is focused on improving and developing student competencies. Based on the Regulation of the directorate general of primary and secondary education of the Ministry of Education and Culture (MoEC), the majors in vocational schools in Indonesia classified into Technology and Engineering, Energy and Mining, Information and Communication Technology, Health and Social Work, Agribusiness and Agrotechnology, Maritime Affairs, Business and Management, Tourism, Arts and Creative Industries. These majors then divided into 49 programs, and 147 set of competencies (Directorate of Vocational Development, 2018). However, other than the technical competencies, vocational students also administered to acquired other competencies such as foreign languages including Japanese language to broaden their prospect for employment after they graduated.

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Autonomous learning defined as a circumstance where the learner is solely responsible for all decisions related to their learning and for implementing those decisions out (Gardner & Miller, 1996) which involve learners to take greater responsibility for what they learn, how they learn, and when they learn. In other words, autonomous learning is defined as "the ability to take charge of one's own learning" (Holec, 2001). Balçıkanlı (2010) explained that autonomous learning is a learning process where students are involved in determining the direction of learning and how the learning process conducted, which allows gradual learning to teach a skill to students. While to ensure that students are able to master a skill or competency before moving on to the next level, several learning styles and instructional resources must be used (Rahman, Rozali, Samah, Abu Bakar, Ahmad, Gerijih, & Zakariah, 2022), as integrating technology in teaching and learning. Technology integration in the classroom is one of the instructional strategies that can be adopt to improve student learning and boost their engagement in class. The TVE idea of learning is based on the student's learning preferences and styles, that they preferred learning i.e. through the use of visual aids that can provide the simulation of subject matter (Rahman, Rozali, Samah, Abu Bakar, Ahmad, Gerijih, & Zakariah, 2022). One of the strategies that can be considered able to stimulate students' motivation and enthusiasm is by using computer media which is proved as very effective for use in drill and practice methods, including language learning (Decoo, 1994; Hubbard & Siskin, 2004).

In language learning, Computer-Assisted Language Learning (CALL) is developed based on Computer Assisted Instruction (CAI) which is a learning method conducted with the help of computer technology (Chapelle & Jamieson, 1986). As technology advances, CALL then becomes MALL (Mobile Assisted Language Learning), which offers more flexibility and mobility (Chinnery, 2006; Jarvis & Achilleos, 2013) in supporting students' autonomous learning. In the development of learning media, there are many things that must be considered, such as the type of the media, how to use it, and the expected results of the implementation of the media that will be developed. One of MALL media that is being widely used and developed is smartphones applications, as defined by Kukulska-Hulme (2012) as mobile technology which can be used to enhance language learning, especially in situations where device portability offers certain advantages. Learning using MALL should precise, efficient, proportional, appropriate, consistent, original, and structured so that the learning process can run optimally (Traxler, 2009).

MALL can also be implemented through different learning methods, including presentation, demonstration, discussion, drill and practice, tutorial, cooperative learning, games, simulation, discovery, and problem solving. All of these approaches, particularly the drill-and-practice approach, are able to enhance the autonomous learning (Lai, 2019; Haristiani & Rifai, 2019). Apart from MALL, chatbot also often used as learning media that enhance autonomous learning. A chatbot which also known as talkbot, chatterbot, Bot, IM bot, interactive agent, or artificial conversational entity, is a computer program or artificial intelligence, which carries out conversations through audio or text and interact with users in a particular domain or topic by giving intelligent responses in natural language (Shevat, 2017; Abdul-Kader & Woods, 2015; Azwary, Indriani, & Nugrahadi, 2016; Levy, 2009), and functioned as a reactive application with a conversational interface (Baudart, Hirzel, Mandel, Shinnar, & Siméon, 2018). Chatbot works by interpreting the instruction or order given by a user, processes the intent of the instruction or order, determines and executes what it needs to do based on user's instructions or order, and delivers final results of the program execution to the user. In general, users interact by giving questions or comments, and the chatbot will provide responses that might include comments, answers or new topics (Huang, Zhou, & Yang, 2007).

A more sophisticated chatbot, such as Lingubot, manage to respond by continuing the conversation with the user, reading or writing to external systems (opening a web page or updating a database), or even a combination of these (Huang, Zhou, & Yang, 2007). Several chatbots in language learning especially in English learning have been developed, such as ELIZA and ALICEBOT (Jia, 2009), chatbot Lucy (Wang & Petrina, 2013), Freudbot (Heller, Proctor, Mah, Jewell, & Cheung, 2005), and Gengobot to enhance Japanese language learning (Haristiani, Danuwijaya, Rifai, & Sarila, 2019). The implementation of chatbot in language learning have been reported as useful and supportive as it can be used anytime and anywhere (Jia, 2004; Jia, 2009; Fyer & Carpenter, 2006; Haristiani & Rifai, 2020). Chatbot also reported as effective to provide distance education (Heller, Proctor, Mah, Jewell, & Cheung, 2005), and support students' personal learning environment (Haristiani & Rifai, 2021), as well as hypothesized in this study to be effective in supporting autonomous learning of vocational students (Hu, 2020). Hence, as an attempt to utilize autonomous learning of vocational students, the use of chatbot-based smartphone application which integrated to social media LINE will be implemented in this study to enhance basic Japanese language learning of students in vocational high schools.

2. Methodology

A survey method was employed in this study as a quantitative research strategy. This method was chosen according to the research objectives, namely to explore information related to the use of chatbot-based application for basic Japanese language learning media. The next subtopic provides explanations of sample, instrument, data collection, and data analysis in detail.

2.1 Sample

Students at vocational schools served as the sample population of this study. The students chosen are the students who have studied Japanese as compulsory subjects from different majors in vocational schools including automotive, electrical engineering, information and technology, and agricultural. These majors are the majors whose graduates are in high demand to work in Japan. The total of 100 students of 8 vocational schools in Indonesia were selected to be the sample of this study through random sampling technique.

2.2 Instrument

The research team created the questionnaire that was utilized in this study, with the key components being an assessment of the application and its features, the contents of the application, and students' perceptions of the application domain. The questionnaire is divided into two main sections: Section A is for demographic information, and Section B is for application, content, and perception components. The survey was written in Indonesian to make it understandable by respondents from various demographic backgrounds. The questionnaire contains 46 questions or statements which are divided into 3 aspects, namely Application and Features Aspect (Unit A), Content Aspect which is divided back into 5 parts, namely '*Pencarian Tata bahasa (Grammar Search)*' and '*Index Tata Bahasa* (Grammar Index)' Feature (Unit B), 'Latihan Tata bahasa (Grammar Exercise)' Feature (Unit C), the 'Belajar Huruf Jepang (Learn Japanese Letters)' Feature (Unit D), the 'Belajar Sapaan Bahasa Jepang (Learn Japanese Greetings)' Feature (Unit E), and the '*Kosakata Keahlian* (technical Vocabulary)' Feature (Unit F), and Perceptions to Applications aspect (Unit G).

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Table 1 - Description of section in questionnaire

Section	Description	No of items
A	Respondent Demography	1
B	Evaluation and Feedback of Application Design, Utility, and Contents (Unit A)	11
	Evaluation and feedback on application and features' design and utility (Unit B - F)	23
	Evaluation and feedback on application and features' contents	
	Students' perception on the application as learning medium (Unit G)	12
	Total	**47**

Students were asked to give their evaluation on Gengobot application and its' features by choosing Likert scale provided between scale of 1 to 4 with the following descriptions: 1 = Strongly disagree (SD), 2 = Disagree (D), 3 = Agree (A), 4 = Strongly agree (SA). The questionnaire data was then analyzed using SPSS 24 with the results as presented in table 2.

Table 2 - Data analysis of the questionnaire results using SPSS 24

Q	Valid	Missing	Mean	Cronbach's Alpha
Unit A questions (A10-A11)	100	0	3.43	0.947
Unit B questions (B1-B8)	100	0	3.40	0.933
Unit C questions (C1-C6)	100	0	3.43	0.927
Unit D questions (D1-D5)	100	0	3.47	0.908
Unit E questions (E1-E2)	100	0	3.52	0.882
Unit F questions (F1-F2)	100	0	3.35	0.874
Unit G questions (G1-8)	100	0	3.43	0.948

As seen in table 2 Cronbach's alpha for each questionnaire unit is above 0.7 indicating great reliability and suitability for application in actual research (Brown, 2002; Gliem & Gliem, 2003; Taber, 2018). Besides of that each each questionnaire unit's Cronbach's alpha is below 0.95 that indicates there is no multicollinearity issue or data redundancy in the questionnaire (Sharma, 2016; Kaux et al., 2016; Franco-Macías et al., 2020).

2.3 Data Collection

The questionnaires were distributed to the sample using online survey, which followed by interview to several selected students. The ethical considerations when conducting the online survey and interview were considered, and the respondents also understood the criteria set. As the study conducted during the pandemic, all communication process was conducted online using social media and emails. Overall, the data collection has taken approximately within a month with a response rate of 35%.

2.4 Data Analysis

After the questionnaire data were collected, the data were analyzed systematically using SPSS 24 as an analysis tool. First, the data will be validated using the SPSS 24 validation test. After that, the data will be tested for reliability using the Cronbach Alpha Reliability test in SPSS 24. The invalid data if any, were eliminated from the questionnaire so that the data can be analyzed further. The data that has been tested for reliability and validity, and analyzed using descriptive analysis using SPSS 24 to obtain the mean and frequency of the data which is interpreted as percentage. The flow of data analysis in this study is as shown in Figure 1.

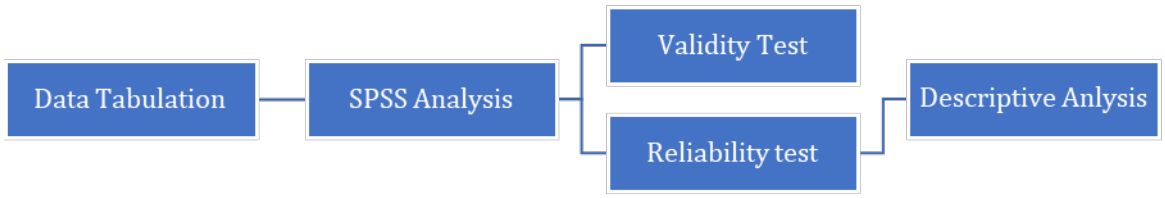

Fig. 1 - Data analysis flowchart

2.5 Chatbot Application Development: Gengobot

The chatbot application development used MVC paradigm which has three-way factors including programs associated to the application domain, such as database settings (models), programs that manage how an application displays (views), and programs that regulate how users interact with views and models (interface). Moreover, Adobe Illustrator CC software was used to create the Gengobot User Interface (UI) using established color schemes and concept designs.

The databases in Gengobot application were created using MySQL and comprised into five main databases in the application development process, namely (1) User database, which is used for storing user data including name, language used, and practice scores; (2) Grammar database, including index and usage examples; (3) Exercise database consisting questions and answers; (4) Japanese character list consisting list of Hiragana and Katakana; and (5) Vocational related vocabularies database. The grammar database and questions were created based on the grammar equivalent to the material of the basic level (N5) of the internationally recognized Japanese Language Proficiency Test (JLPT).

As the program development completed, it was then integrated to LINE instant messaging application as the chatbot domain, using webhook server and LINE messaging API feature. After the integration, Gengobot can be used widely and freely accessed from LINE social media platform anytime and anywhere.

2.6 Chatbot Application Design and Features

The Gengobot application features including ‘Grammar search’, ‘Grammar index’, and ‘Exercise’ features (Haristiani & Rifai, 2019). However, the other features were added to the application as an attempt to advance the quality and utility of Gengobot, as well as perfecting the existing menus and features. The additional features were including ‘Japanese characters’ which consists of Japanese characters namely Hiragana and Katakana along with its’ writing order, ‘Japanese greetings’, and ‘List of terminology’ used in the field of engineering and Informational Technology (IT), to support the needs of vocational students’ in learning Japanese.The UI and display of the features are as seen in figure 2.

Fig. 2 - User Interface (UI) and features of Gengobot application features

3. Results and Discussion

3.1 Evaluation on The Design and Utility of Gengobot Applications and Its' Features

Questionnaire data related to the application were collected to determine the students' evaluation of the Gengobot application overall including its' design and utility. The students were also asked to provide feedback regarding their perception of the features in Gengobot, whether the features are useful and helpful for their basic Japanese learning. The following table 3 shows the results of the questionnaire data analysis for the application and feature aspects.

Table 3 - Evaluation results and feedback on the application and features (Unit A)

No	Statement	Mean	SD	D	A	SA	%
1	Gengobot application is easy to use.	**3.33**	2	7	47	44	83.3%
2	Gengobot application is innovative.	**3.51**	1	4	38	57	87.8%
3	Gengobot application design is attractive.	**3.47**	2	7	33	58	86.8%
4	'*Pencarian Tata bahasa (Grammar Search)*' feature is easy to understand.	**3.36**	2	8	42	48	84.0%
5	'*Index Tata Bahasa* (Grammar Index)' feature is easy to understand.	**3.36**	2	4	50	44	84.0%
6	'Latihan Tata bahasa (Grammar Exercise)' feature is easy to understand.	**3.39**	2	8	39	51	84.8%
7	'Belajar Huruf Jepang (Learn Japanese Letters)' feature is easy to understand.	**3.41**	3	5	40	52	85.3%
8	'Belajar Sapaan Bahasa Jepang (Learn Japanese Greetings)' feature is easy to understand.	**3.45**	2	4	41	53	86.3%
9	'*Kosakata Keahlian* (Technical Vocabulary)' feature is easy to understand.	**3.40**	1	7	43	49	85.0%
10	Features in Gengobot application is interesting.	**3.43**	2	7	37	54	85.8%
11	The features in Gengobot application are useful to help learn basic Japanese.	**3.60**	3	1	29	67	90.0%

From table 3, it can be seen that 83.3% of students agreed that Gengobot is useful and user friendly. Regarding the application's design and innovation, around 87% of students strongly agreed that the Gengobot application is innovative and has an attractive interface. As for features, around 84% of students strongly agree that the '*Pencarian Tata bahasa (Grammar Search)*' feature, '*Index Tata Bahasa* (Grammar Index)' feature, and 'Latihan Tata bahasa (Grammar Exercise)' feature are user friendly and easy to understand. For the 'Belajar Huruf Jepang (Learn Japanese Letters)' feature and the '*Kosakata Keahlian* (Technical Vocabulary)' feature, around 85% of students strongly agree that the two features are easy to understand and user friendly. 'Belajar Sapaan Bahasa Jepang (Learn Japanese Greetings)' feature received the highest

rating among other features, where 86.3% of students strongly agree that this feature is user friendly and easy to understand. Overall, 85.8% of students strongly agree that all features in Gengobot are interesting.

The statement that received the highest average of 90.0% was the statement about features in Gengobot application which is stated to be useful to help them learn basic Japanese. The assessment results of this aspect indicate that students strongly agree that the Gengobot application can be used to learn Japanese independently, so that they can develop their own Japanese learning strategies through the Gengobot application.

When comparing the results of evaluations in this unit, it is perceived that students gave the lowest evaluation on the accessibility of Gengobot application. From the follow-up interview results, it is discovered that this is caused by students' confusion in accessing the Gengobot application on LINE, students' confusion regarding the main menu or how to return to the main menu when using Gengobot, and that the instructions on the menus in Gengobot application considered to be rather unclear

3.2 Evaluation on the Gengobot Applications' Contents

The content aspect of the questionnaire aims to determine student evaluations of the content contained in the features of the Gengobot application. 24 questions on this aspect are divided into 5 sections based on the features available in Gengobot, namely '*Pencarian Tata bahasa (Grammar Search)*' & '*Index Tata Bahasa* (Grammar Index)' feature, 'Latihan Tata bahasa (Grammar Exercise)' feature, the 'Belajar Huruf Jepang (Learn Japanese Letters)' feature, the 'Belajar Sapaan Bahasa Jepang (Learn Japanese Greetings)' feature, and the '*Kosakata Keahlian* (Technical Vocabulary)' feature. The results of students' evaluations of the content on each features in Gengobot application is presented in Figure 3.

Figure 4 shows some of the raw materials that have been used in the manufacture of bioplastics in previous studies. The raw materials are Oil, Chitosan, Algae, Waste Water, Corn, Soy Protein, Corn Starch, Banana Peel, Sugarcane, Seaweed, Cassava Starch, Palm oil, Cassava, Food Waste, Gelatin, Potato, Sugar, Wheat Gluten, Rice Straw, Sugar Palm Fiber, Banana, Waste Paper, Orange Peel, Nano clay, Wood, Sago starch, Fossil Fuel, Cassava Starch Glucomannan, Potato Starch, Plant Oil, Cassava Peel, Sweet Potato Starch, Egg, Jackfruit Seed, Arena Pinnate, Rice Husk, Mango Starch, and Coffee. Oil is the most widely used raw material in the manufacture of bioplastics with a total link strength of 139, Chitosan 117 total link strength, and Algae 103 total link strength. Meanwhile, coffee is still little used as a raw material for making bioplastics with a total link strength of 13.

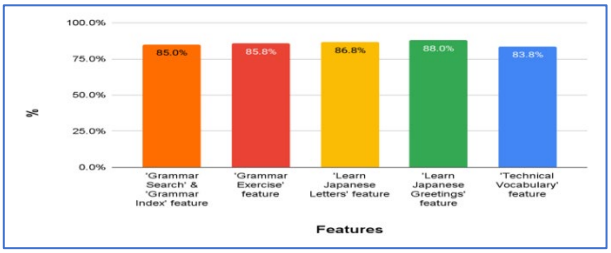

Fig. 3 - Student evaluation of content in Gengobot features

Figure 3 shows that all features evaluated as 83% and above. The 'Belajar Sapaan Bahasa Jepang (Learn Japanese Greetings)' feature gets the highest percentage of ratings for the content which is 88%, while the feature with the lowest rating is '*Kosakata Keahlian* (Technical Vocabulary)' feature with a rating of around 83%.

3.2.1 '*Pencarian Tata Bahasa (Grammar Search)*' and '*Index Tata Bahasa* (Grammar Index)' Feature

The following table 4 shows the results of student evaluations about the contents in '*Pencarian Tata bahasa (Grammar Search)*' and '*Index Tata Bahasa* (Grammar Index)' features in Gengobot application.

The results of the data analysis in table 4 show that the students strongly agree with the statements related to the contents in '*Pencarian Tata bahasa (Grammar Search)*' and '*Index Tata Bahasa* (Grammar Index)' features. Most of the students were strongly agree that the 'Grammar Search' feature is user friendly, as evidenced by the percentage score of 86.5%. Meanwhile, 84.5% of students agreed that the 'Grammar Index' feature is also user friendly. For the suitability of the grammar material, about 86% of students strongly agree that the grammar material in the 'Grammar Search' and 'Grammar Index' features is in accordance with the basic Japanese material they are learning, so they can easily understand the grammar material in the application, and 83.3% of the students agree that the grammar example sentences in the application are easy to understand. Moreover, around 84% of students strongly agreed that the grammar material in these two features is comprehensive and in accordance with the basic Japanese grammar they are studying.

Based on above results, it can be perceived that generally, the students' agreed that Gengobot application helps them understand Japanese grammar materials easier, especially the basic Japanese grammar they are studying. By accessing the '*Pencarian Tata bahasa (Grammar Search)*' and '*Index Tata Bahasa* (Grammar Index)' features, students can learn new

Japanese grammar or able to practice Japanese grammar learned before, on their own outside the classroom without the help of a tutor or teacher.

Table 4 - Evaluation results on '*Pencarian Tata bahasa (Grammar Search)*' and '*Index Tata Bahasa* (Grammar index)' feature content (Unit B)

No	Statement	Mean	SD	D	A	SA	%
1	'*Pencarian Tata bahasa (Grammar Search)*' feature is easy to use.	**3.46**	2	2	44	52	86.5%
2	'*Index Tata bahasa* (Grammar Index)' feature is easy to use.	**3.38**	1	6	47	46	84.5%
3	The grammar consisted in Gengobot application is compatible with basic Japanese language learning material.	**3.44**	2	4	42	52	86.0%
4	The explanation of grammar is easy to understand.	**3.33**	2	9	43	46	83.3%
5	The examples of grammar usage in Gengobot application are easy to understand.	**3.32**	2	7	48	43	83.0%
6	The grammar material in Gengobot application is compatible with the Japanese language material being studied.	**3.38**	3	6	41	50	84.5%
7	The grammar material in Gengobot application is comprehensive.	**3.39**	1	4	50	45	84.8%
8	Gengobot application helps me to understand basic Japanese grammar easier and better.	**3.46**	2	2	44	52	86.5%

3.2.2 'Latihan Tata Bahasa (Grammar Exercise)' Feature

After evaluating the content of '*Pencarian Tata bahasa (Grammar Search)*' and '*index tata bahasa* (grammar index)' features, the students evaluate the contents in the 'Latihan Tata bahasa (Grammar Exercise)' feature. The results of data analysis related to the content of the 'Latihan Tata bahasa (Grammar Exercise)' feature can be seen in table 5.

Table 5 - Evaluation result on 'Latihan Tata bahasa (Grammar Exercise)' feature content (Unit C)

No	Statement	Mean	SD	D	A	SA	%
1	The practice contained in Gengobot application exercise feature is suitable with basic Japanese language learning material.	**3.47**	1	5	40	54	86.8%
2	The practice contained in Gengobot application exercise feature help me understand basic Japanese language learning material better.	**3.46**	2	5	38	55	86.5%
3	'Latihan Tata bahasa (Grammar Exercise)' feature in Gengobot application is easy to use.	**3.43**	2	4	43	51	85.8%
4	Sub-features in 'Latihan Tata bahasa (Grammar Exercise)' feature in Gengobot application (i.e. leaderboard, score, type of exercise, etc.) is interesting.	**3.38**	2	4	48	46	84.5%
5	Explanations in 'Latihan Tata bahasa (Grammar Exercise)' feature in Gengobot application are easy to understand.	**3.38**	1	8	43	48	84.5%
6	'Latihan Tata bahasa (Grammar Exercise)' feature in Gengobot application (i.e. leaderboard, score, type of exercise, etc.) is innovative.	**3.46**	1	6	39	54	86.5%

As presented in table 5, 'Latihan Tata bahasa (Grammar Exercise)' is a feature in Gengobot application to test the grammar mastery that previously been accessed or learned in the '*Pencarian Tata bahasa (Grammar Search)*' and '*index tata bahasa* (grammar index)' features. About 86% of students answered that they strongly agreed that the grammar exercises in this feature are easy to use, and the exercise questions in Gengobot application are in accordance with basic Japanese material they are studying so it can help students understand the basic Japanese material better. The suitability of the material in Gengobot application and the material they are learning in the classroom can help students to practice basic Japanese grammar independently, without fixating on school textbooks. Meanwhile, about 84% of students strongly agree that the Leaderboard, score, and the type of exercise are interesting, also considered innovative by 86.5% of students. Further, the students reckon that the explanations provided along with the answer of the questions in the 'Grammar Exercise' feature are also easy to understand (84.5%). The availability of these explanations enabled students to practice and check their understanding about Japanese grammars they learned without the necessity to be assisted by a teacher.

3.2.3 '*Belajar Huruf Jepang* (Learn Japanese Characters)' Features

Apart from features related to grammar, Gengobot also has features that can help users to learn two types of Japanese characters, namely Hiragana and Katakana. The '*Belajar Huruf Jepang* (Learn Japanese Characters)' feature contains a list of Japanese Hiragana and Katakana characters along with how to read and write them. Table 6 contains the results of student responses to the contents in the 'Belajar Huruf Jepang (Learn Japanese Letters)' feature.

Table 6 - Evaluation result on 'Belajar Huruf Jepang (Learn Japanese Letters)' feature content (Unit D)

No	Statement	Mean	SD	D	A	SA	%
1	'*Belajar huruf Jepang* (Learn Japanese characters)' feature in Gengobot application helped me to learn Japanese characters.	**3.53**	4	2	31	63	88.3%
2	'*Belajar huruf Jepang* (Learn Japanese characters)' feature in Gengobot application helped me to read and write Japanese characters.	**3.40**	2	8	38	52	85.0%
3	'*Belajar huruf Jepang* (Learn Japanese characters)' feature in Gengobot application is easy to use.	**3.42**	2	6	40	52	85.5%
4	'*Belajar huruf Jepang* (Learn Japanese characters)' feature in Gengobot application is attractive.	**3.50**	3	2	37	58	87.5%
5	'*Belajar huruf Jepang* (Learn Japanese characters)' feature in Gengobot application is innovative.	**3.48**	2	3	40	55	87.0%

Students considered 'Belajar Huruf Jepang (Learn Japanese Letters)' feature to be very helpful for them to recognize Japanese characters, indicated by around 88% of students who strongly agreed with the statement. About 88% of students strongly agreed that this feature is interesting and innovative. Meanwhile, about 85% of students strongly agreed that 'Belajar Huruf Jepang (Learn Japanese Letters)' feature is user friendly, so that it can help students to learn, read, and write Japanese characters independently.

3.2.4 'Belajar Sapaan Bahasa Jepang (Learn Japanese Greetings)' Feature

The next feature that is assessed by the students on the content aspect is 'Belajar Sapaan Bahasa Jepang (Learn Japanese Greetings)' feature. This feature provides simple Japanese greetings as a provision for basic Japanese learners to learn greetings that are often used in everyday conversation. The results of the data analysis of student responses to 'Belajar Sapaan Bahasa Jepang (Learn Japanese Greetings)' feature can be seen in table 7.

The results of data analysis in table 7 show that 88.5% of students strongly agreed that the content in the 'Belajar Sapaan Bahasa Jepang (Learn Japanese Greetings)' feature can help students to understand simple and basic Japanese greetings. This feature is also considered helpful for students to practice simple Japanese greetings (87.5%). The contents and explanations provided in this feature can stimulate the students to learn and practice simple Japanese greetings unassisted freely.

Table 7 - Evaluation results of 'Belajar Sapaan Bahasa Jepang (Learn Japanese Greetings)' feature content (Unit E)

No	Statement	Mean	SD	D	A	SA	%
1	'Belajar Sapaan Bahasa Jepang (Learn Japanese Greetings)' feature in the Gengobot application helps me to understand simple Japanese greetings.	**3.54**	3	3	31	63	88.5%
2	'Belajar Sapaan Bahasa Jepang (Learn Japanese Greetings)' feature in Gengobot application helps me to use simple Japanese greetings.	**3.50**	2	4	36	58	87.5%

3.2.4 '*Kosakata Keahlian* (Technical Vocabulary)' Feature

The vocabularies in this feature are categorized based on the area of expertise provided in vocational high school. Figure 2 shows the students' responses about '*Kosakata Keahlian* (Technical Vocabulary)' feature which gets the lowest evaluation compared to other features (83.8%). The detailed responses of this feature are presented in table 8.

Table 8 - Evaluation results on '*Kosakata Keahlian* (Technical Vocabulary)' feature's content (Unit F)

No	Statement	Mean	SD	D	A	SA	%
1	'*Kosakata Keahlian* (Technical Vocabularies)' feature in Gengobot application helps me to find out Japanese vocabulary skills.	**3.33**	1	8	48	43	83.3%
2	'*Kosakata Keahlian* (Technical Vocabularies)' feature in Gengobot application helps me to learn vocative terminologies in Japanese language.	**3.36**	3	4	47	46	84.0%

As presented in table 8, 83.3% of students agreed that the '*Kosakata Keahlian* (technical Vocabulary)' feature can help them find out Japanese vocabulary related to engineering and computer/IT fields, and 84.0% of students agreed that this feature can help them learn the vocabularies. It can also be seen from table 8 that the students' evaluation on the contents of '*Kosakata Keahlian* (Technical Vocabulary)' feature tends to be low compared to those of other features'. Based on the results of the interview, this was caused by the limitations of the type of vocabularies, the number of the vocabularies, and sample sentences provided for each vocabulary.

3.1.5 Students' Perceptions of the Gengobot Application as a Learning Media

Apart from evaluations about the features, applications, and content aspects of Gengobot's features, the students were also asked to share their impressions and perceptions of Gengobot application overall as a learning medium by answering 12 questions in the questionnaire. Table 9 shows the results on students' perceptions of the Gengobot application as a learning medium.

As shown in table 9, most students (87.5%) choose that they are interested to use Gengobot further to support their basic Japanese learning. Moreover, 80.8% students agreed that Gengobot suits their learning style, and intend to use the Gengobot application for some time in the future (82.3%). About 85% of students strongly agreed that the Gengobot application provides easy-to-understand grammar, vocabulary materials, and grammar exercise questions that students can complete, so that Gengobot facilitates their basic Japanese grammar learning needs. Students also rated that Gengobot can be used to learn basic Japanese anytime and anywhere (86.5%), and they are very open to using new technologies such as the Gengobot application. Further, the highest rating from students with a percentage of 89.0% was given to the statement that the Gengobot application is suitable for independent learning in learning basic Japanese. This result indicated that Gengobot application as overall suitable to support vocational high schools students to perform autonomous learning in studying basic Japanese.

Table 9 - Evaluation results on the perception aspect of the Gengobot application (Unit G)

No	Statement	Mean	SD	D	A	SA	%
1	I am interested to use Gengobot application to learn basic Japanese.	**3.50**	3	2	37	58	87.5%
2	I want to use Gengobot application according to my learning style	**3.23**	2	10	51	37	80.8%
3	The Gengobot application provides grammar, exercises, and easy-to-understand vocabularies index.	**3.43**	3	2	44	51	85.8%
4	The Gengobot application enable me to learn basic Japanese anytime and anywhere.	**3.46**	2	4	40	54	86.5%
5	The Gengobot application facilitates my needs in learning basic Japanese grammar.	**3.39**	2	5	45	48	84.8%
6	I will continue to use Gengobot application in the future.	**3.29**	3	7	48	42	82.3%
7	The Gengobot application is fun to use.	**3.49**	3	2	38	57	87.3%
8	Gengobot application is suitable for learning basic Japanese independently.	**3.56**	3	2	31	64	89.0%

3.3 Discussion

This research is conducted to examine the feedback and perceptions from vocational high school students on Gengobot which is a chatbot-based application. The results showed that the students rated the Gengobot application as user friendly, attractive and innovative, and the features provided in the application are easy to understand. The results of the data analysis are in accordance with previous studies related to chatbot-based applications implementation studies (Bii, 2013; Goda, Matsukawa, Hata, & Yasunami, 2014; Haristiani, Danuwijaya, Rifai, & Sarila, 2019; Haristiani & Rifai, 2020), that based on the students' evaluatins, the Gengobot application is useful to help them learn basic Japanese. The students considered that the features in Gengobot application increased their interest and motivation in learning Japanese because the features are easy to use, innovative, and fascinating (Heller, Mah, Jewell, & Cheung, 2005; Sivabalan & Ali, 2019).

The results of student evaluations also showed that the contents in Gengobot features is in accordance with basic Japanese learning materials. Features related to grammar are considered complete and in accordance with the Japanese material that students are studying. The explanations, example sentences, and grammar exercises make it easier for students to understand Japanese grammar material they learned in the classroom. The grammar exercise feature in Gengobot application is considered effective to improve understanding of basic Japanese better (Oki, Nakayama, & Shimizu, 2001; Haristiani & Rifai, 2020).

In addition to features related to grammar, Gengobot also provides other features that support students' basic Japanese learning, including features for learning Japanese letters, features to learn simple daily Japanese greetings, and understanding Japanese terminologies related to technology and computer/IT. The features related to Japanese characters were considered useful by students to improve their reading and writing skills in Japanese characters. While students assess the Japanese greetings feature can help them to use simple Japanese greetings in everyday life. For the Japanese technical vocabulary feature, students agreed that the feature can help them understand new vocabularies, but the category and number of technical vocabularies still needs to be increased. However, overall the Gengobot's features are assessed as useful to improve the ability to read and write Japanese characters, understanding grammar, practice Japanese greetings, and understanding Japanese technical vocabulary, which is in line with the results of previous studies related to chatbot-based applications (Fryer et al., 2019; Haristiani , Danuwijaya, Rifai, & Sarila, 2019; Rifai, Haristiani, & Risda, 2020; Haristiani & Rifai, 2020).

Students' assessment of Gengobot application and its' features also portrayed in their perception of Gengobot as a learning medium. Students assessed Gengobot application as interesting and innovative application as a medium for learning basic Japanese, and corresponded with the results of research on learning media in the form of computer-based applications that are considered effective to support learning (Jia, 2009; Keezhatta & Omar, 2019). Gengobot contents of grammar, exercises, and vocabulary materials also facilitate students' learning needs of basic Japanese grammar learning. The students considered that Gengobot application is suitable for independent Japanese learning, because the Gengobot

application allows them to be able to learn basic Japanese anytime and anywhere. Overall, students are very open to using new technologies such as the Gengobot application as a medium for learning basic Japanese.

The results of the analysis above regarding students' perceptions of the features and contents in Gengobot application as a learning medium showed that Gengobot application is suitable to be used as an autonomous learning medium in language learning. With Gengobot application, students can learn Japanese without space and time limitations, since students are free to determine the time, location, and even learning style as they prefer (Rosell-Aguilar, 2018; Lai, 2019; Liu & Liu, 2022;). The evaluation results on the content aspects also describe that the Gengobot application features allow students to learn Japanese characters, grammar, and Japanese greetings independently. It also said that with students learning autonomy, students learning abilities and it effectiveness will also increase (Dickinson, 1995; Shi & Han, 2019) . In other words, students can develop their own learning strategies (Ivanovska, 2015; Petra, Jaidin, Perera, & Linn, 2016) through the features in the Gengobot application. In addition, the result of this research show that Gengobot as chatbot-based medium for learning basic Japanese stimulates the motivation of Technical and vocational students in learning, especially in Japanese learning, because it has features that engage students to learn basic Japanese anytime and anywhere (Haristiani & Rifai, 2019; Haristiani & Rifai, 2020; Haristiani & Rifai, 2021).

4. Conclusion

Gengobot is a chatbot-based application that can be used as an independent learning medium to improve basic Japanese language skills. Vocational school students' evaluation on the design and usability of the Gengobot application and features were satisfactory, and showed that Gengobot proven to be suitable as learning medium as an assistive technology for learning Japanese. The results of the evaluation and student feedbacks showed that Gengobot application can be used anywhere and everywhere, so it is appropriate to be used in learning Japanese independently. The contents in Gengobot application also consistent with the Japanese learning material they are studying in the classroom, hence Gengobot perceived as helpful for the students to learn basic Japanese according to their needs and learning style. Overall, it can be concluded that Gengobot as a chatbot-based application can be recommended as an attractive, innovative, and supportive Japanese language learning medium for vocational students. Even so, the Gengobot application still requires further development in terms of applications, features and contents. In terms of features and content, it is necessary to add a more diverse vocabulary of expertise, adapted to the vocational field of expertise. In addition, Gengobot also has the potential to be developed into a chatbot application on other chat applications or as an independent application besides LINE to increase the effectiveness of this application.

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