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LIKARI (Five Words in A Day) Application to Improve Vocabulary Mastery in Japanese Language Learning

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ABSTRAK

Terdapat beberapa kendala yang dialami siswa dalam memahami dan menguasai kosakata Bahasa Jepang. Siswa tidak memiliki strategi yang tepat dan menarik untuk mempelajari kosa kata. Oleh karena itu tujuan penelitian ini yaitu mengembangkan media pembelajaran interaktif dengan menggunakan aplikasi berbasis Android bernama "Likari". Aplikasi ini mempunyai tujuan tertentu dengan menggunakan metode penguasaan lima kosakata bahasa Jepang dalam sehari. Penelitian ini menggunakan jenis penelitian Research and Development (R&D) dengan menggunakan model pengembangan Borg & Gall. Metode pengumpulan data menggunaka observasi, kuesioner, dan tes. Uji coba lapangan dilakukan dalam skala kecil pada 34 siswa kelas XI. Ahli yang terlibat dalam penelitian ini adalah 2 orang ahli materi dan 2 orang ahli media. Teknik yang digunakan untuk menganalisis data adalah analisis deskriptif kualitatif, kuantitatif, dan statistik inferensial. Hal penelitian menunjukkan bahwa aplikasi "Likari" layak atau valid digunakan dalam pembelajaran di sekolah. Berdasarkan hasil penelitian menunjukkan bahwa ahli media memberikan penilaian terhadap penerapan sebesar 92% dan ahli materi sebesar 87%. Selain itu, aplikasi juga masuk dalam kategori sangat praktis dengan persentase skor yaitu 92%. Penggunaan aplikasi "Likari" sangat efektif dalam meningkatkan kemampuan penguasaan siswa dalam pembelajaran Bahasa Jepang dimana skor N gain sebesar 73,76%.

ABSTRACT

Students experience several obstacles in understanding and mastering Japanese vocabulary. Students need to have appropriate and exciting strategies for learning vocabulary. Therefore, this research aims to develop interactive learning media using an Android-based application called "Likari." This application has a specific goal of using a method of mastering five Japanese vocabulary words in a day. This research uses Research and Development (R&D) research using the Borg & Gall development model. Data collection methods use observation, questionnaires, and tests. Field trials were conducted on a small scale on 34 class XI students. The experts involved in this research were 2 material experts and 2 media experts. The techniques used to analyze data are qualitative descriptive analysis, quantitative, and inferential statistics. Research shows that the "Likari" application is suitable or valid for school learning. The research results show that media experts assessed the implementation at 92%, and material experts rated it at 87%. The application is also included in the convenient category with a score percentage of 92%. Using the "Likari" application effectively improves students' mastery skills in learning Japanese, where the N gain score is 73.76%.

1. INTRODUCTION

During the globalization era, the use of information-based technology has been developing where it is in line with the increasing human needs. Then, technology has also greatly influenced the lifestyle of modern humans by simplifying them to carry out their activities effectively and efficiently. The educational field is one the fields using a lot of technologies for its implementation (Rakhimov & Rakhimova, 2021; Shoraevna et al., 2021). The world of education faces challenges with various existing learning metamorphoses requiring adjustments for its implementation (Gluzman et al., 2018; Kartika,

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Amril, et al., 2020). The happening technological developments make education become more advanced and developed where it causes people to be more creative and educative (Criollo-C et al., 2021; Sambung et al., 2017). Generally, technological developments require mastery of foreign language skills. Language is needed because it is the most effective communication tool in conveying messages to other people. By using a language, a person can gain knowledge and increase his insight (Mohammad, 2018; Timotheou et al., 2022; Toliwongi, 2021). To overcome this phenomenon, there are many higher education institutions in Indonesia make foreign language Study Programs or Department to facilitate and support the foreign language skills for their graduates. One of the foreign languages having a great demand at several educational institutions in Indonesia is Japanese Language. This language is very popular among Indonesian people, especially young people (Amril et al., 2022). The number of Japanese language learners in Indonesia is more than South Korea language learner where it is shown on the second-rank after China even though Indonesia is basically not a country that has *Kanji* letters in its language like Chinese or Korean (Firmansyah & Rahmawati, 2020).

Japanese language is learned from High School or Vocational School level to universities or higher education in Indonesia. It requires students to be able to master four aspects of language skills called speaking, listening, reading and writing (Nishizawa et al., 2022). Vocabulary is an important aspect that must be mastered well. A strong comprehension of vocabulary becomes an important factor to be able to communicate easily (Lukman et al., 2019) (Nishizawa et al., 2022).. Vocabulary mastery cannot be ignored in foreign language learning because the stronger a person's vocabulary mastery, the better his language skills (Huang et al., 2021). Improving the students' vocabulary mastery skill will have a positive effect on the four linguistic aspects of the Japanese language mastery. By having good vocabulary mastery, it will make a communication can be implemented both spoken and written well (Parvareshbar & Ghoorchaei, 2016; Susanti & Mugiyanti, 2021).

However, there are several obstacles experienced by students to comprehend and master the Japanese Language vocabulary. They do not have appropriate and interesting strategies to learn the vocabularies, to improve the vocabularies and to use the vocabularies in conversation or communication (Kharismawati et al., 2021). Then, regarding the use of learning media, many teachers have not taken advantages of existing technological developments, for example in mastering Japanese language letter lesson such as *hiragana* and *katakana*. They still use letter cards and power points for teaching and learning process. The similar thing also happens in vocabulary learning where the used learning media are still not able to improve students' ability to master Japanese Language vocabularies. It is also not able to involve them actively so that the students do not have an interested and enjoyable class atmosphere (Dewa et al., 2017). Research also states that students prefer technology-based vocabulary learning solutions, which is close to their lives, for example on their smartphone or Android applications (Kharismawati et al., 2021; Tseng et al., 2020). The limited use of interactive and interesting smartphone or Android-based learning media has not been able to increase students' interest in mastering vocabulary comprehension independently (Arthana et al., 2019). During this digital revolution era, the educators, such as lecturer and teacher, must be able to utilize technology effectively, so that the students can be more interested in learning (Arif, 2020; Kartika, Ahadiat, et al., 2020; Liao et al., 2018). One of the approaches to solve the problem in learning Japanese language vocabulary can be overcome by developing creative ideas where one of them is by creating new innovations in learning. Improving vocabulary skill can be achieved by developing technology-based learning media (Gayevska & Kravtsov, 2022; Ying et al., 2021). One of the learning media that can be used to support the learning process is called interactive multimedia. This interactive multimedia can provide direct interaction to users (students), so that it can be used as a support for the independent learning process (Indah Septiani et al., 2020; Umarella et al., 2019; Widyaa et al., 2022). Then, this multimedia will be supported by using the audio and visual aspects simultaneously. Finally, the learning process becomes more interesting and more interactive where it can be implemented anytime/anywhere and even without having a direct involvement of a teacher/lecturer (Sari et al., 2021). Thus, multimedia has been proven to be able to improve a person's learning quality in vocabulary learning, especially Japanese language.

Based on previous problems and research, the researchers will develop a learning media as a solution to the problem of learning on Japanese language vocabulary. This research offers a development of interactive learning media by using an Android-based smartphone application called "Likari" (Five Words in a Day) where it can be used to improve student's vocabulary independently. By using "Likari", it is expected that the students could study Japanese Language vocabulary towards *five words a day* feature which is equipped with written vocabulary (in Japanese language), audio and images. Therefore, it could help them to understand the words independently. The "Likari" application will provide a feature to remind five vocabulary words in a day, and it is also equipped by showing the levels for the users. In the level options, there is a choice of days equipped with a mini quiz or some kinds of game every day. It can

measure the user's comprehension level. This application also provides statistical features on the achievements of vocabulary comprehension made by the users. The "Likari" application is also equipped with a menu of *hiragana* & *katakana* letters. The development of Japanese vocabulary learning media in this research is upgraded in the concept of the provided learning method. The method of mastering five vocabularies in a day is expected to increase user's comprehension equipped with audio and images, so that it is easier to understand and compare with previous learning media. This research aims to develop interactive learning media using an Android-based application called "Likari".

2. METHOD

This research is a Research and Development (R&D) research by using a mixed method. Mixed-method research is a type of research combining quantitative and qualitative research (Indrawan & Jalilah, 2021). The development model used in this research is by Borg and Gall model (Assyauqi, 2020; Supriyono, 2022). There are ten stages in this research model where it is started from conducting preliminary studies to dissemination and product implementation. However, in this article, this research is limited to the fourth stage called expert testing and preliminary field testing. The field testing was conducted on a small scale within 34 students at class XI SMAN 5 Padang. For detailed information, the product development is depicted in the stages of the Borg and Gall model with the following details; The first stage was to collect the information related to the developed product. Then, researchers also identified possible problems that would be met in the product development. These information collection activities were carried out through literature study, observation of pre-existing models, and also needs analysis. The second stage is the step of preparing a plan for the research. The planning starts from formulating research objectives; estimating the funds, energy and time; formulating the qualifications of researchers and setting of participation in the research. The third stage is the preliminary product development stage. In this stage, there are several things to do such as defining the product design; determining the facilities and infrastructure; setting the stages of field test implementation; and also determining the parties involved in the research. This fourth stage is the preliminary testing stage for products that have been developed based on the expert evaluation. The involved experts in this research are 2 material experts and 2 media experts. After completing the media testing by these experts, the next step was to continue with a limited preliminary field testing. This field testing was carried out by using a small group as a sample to collect student responses for being-developed product. Data of product validity was collected by disseminating the validation questionnaire to experts. Meanwhile, product practicality data were collected towards a practicality questionnaire given to teachers and students regarding how to use the "LIKARI" application in learning at the classroom. The instrument grid is presented in Table 1 and Table 2.

Table 1. Results of Media Validation by Media Expert

No.	The Evaluation Aspects
Media Display	
1.	Clarity of manual instruction.
2.	Correlation between language and student logical thinking level.
3.	Capability to encourage the student's curiosity to learn the materials.
4.	The sequences of android media presentation
5.	The support of android media presentation strategies towards the student activeness in learning.
The Ease of Media Use	
6.	The ease of media use in learning both inside and outside the class.
7.	Media support for student autonomy/independent in learning the Japanese Language.
8.	Media capability to improve the student motivation in learning the Japanese language.
9.	Media capability to improve the knowledge.
10.	Media capability to broaden the student knowledge in Japanese Language.
Graphics	
11.	The selection of font type and size supports the media to be more interesting.
12.	The ease to read the text or written information.
13.	The selected color and the combination are well-set-up
14.	The button location is well-located.

Table 2. Results of Media Validation by Material Experts

No	The Evaluation Aspects
Quality of Contents and Purposes	
1.	The materials are in line with competence standard and learning purposes.
2.	The learning media is conceptual-based.
3.	Examples and exercises are related to the materials.
4.	The media can increase the student learning motivation at vocabulary mastery of Japanese Language.
Technical Quality	
5.	The presented simulation on the media can help the student to comprehend the concept about matrix.
6.	The sentences on the media are very clear.
	The button locations are well-located for the students.
Learning Quality	
7.	Media can ease the conceptual comprehension on vocabulary materials of Japanese language.
8.	Media can offer opportunity to learn based on the ability.
9.	Media has facilitated the student for autonomous learning.
10.	Media can involve the students actively.

The techniques used to analyze data are qualitative descriptive analysis, quantitative, and inferential statistics. Qualitative descriptive analysis is used to process data in the form of suggestions or input provided by experts and students. Quantitative descriptive analysis is used to process data through scores given by experts and students. Inferential statistics are used to test the effectiveness of the media being developed. At the end of the lesson, students were given a final test in the form of a vocabulary test for 100 questions to measure their mastery of Japanese Language vocabulary. The final test was analyzed by using paired data t-test to find out how much the impact the "LIKARI" application on students' mastery of Japanese language vocabulary.

3. RESULT AND DISCUSSION

Result

Based on the media expert data, the overall percentage result is 92%. Then, based on data interpretation, the materials given in the mobile learning application is included in the valid qualifications and it is included into Criteria A scoring from 76 % - 100 %. Based on the questionnaire given to media experts, the responses are: 1) At the initial Display, the creator identity must be written, 2) keyboard's loading still takes a long time. The results of product validity by media experts can be seen in Table 3.

Table 3. Results of Media Validation by Media Expert

No.	The Evaluation Aspects	Validity Percentage
Media Display		
1.	Clarity of manual instruction.	90%
2.	Correlation between language and student logical thinking level.	
3.	Capability to encourage the student's curiosity to learn the materials.	
4.	The sequences of android media presentation	
5.	The support of android media presentation strategies towards the student activeness in learning.	
The Ease of Media Use		
6.	The ease of media use in learning both inside and outside the class.	97%
7.	Media support for student autonomy/independent in learning the Japanese Language.	
8.	Media capability to improve the student motivation in learning the Japanese language.	
9.	Media capability to improve the knowledge.	
10.	Media capability to broaden the student knowledge in Japanese Language.	

No.	The Evaluation Aspects	Validity Percentage
Graphics		
11.	The selection of font type and size supports the media to be more interesting.	88%
12.	The ease to read the text or written information.	
13.	The selected color and the combination are well-set-up	
14.	The button location is well-located.	
	Validation Criteria: Very Good/ Very Valid	**92 %**

Based on the percentage of validity results of learning media development from the media experts (92%). It can be concluded that the "LIKARI" application is appropriate for testing in research classes after being revised based on the expert advices. Based on the material experts, overall percentage results 87%. Then, from the data interpretation, the materials given in the mobile learning application is included into valid qualifications and it is included into Criteria A scoring from 76 % - 100 %. Based on the questionnaire and responses evaluations from material experts, the mobile learning application product development was revised in the following sections: 1) There must be improvements in the material design, 2) It needs improvements in the preparation of the exercises, 3) It would be better if the media are arranged together with experts of the learning materials in the relevant field of study. The results of product validity by material experts can be seen in Table 4.

Table 4. Results of Media Validation by Material Experts

No	The Evaluation Aspects	Validity Percentage
Quality of Contents and Purposes		
1.	The materials are in line with competence standard and learning purposes.	88%
2.	The learning media is conceptual-based.	
3.	Examples and exercises are related to the materials.	
4.	The media can increase the student learning motivation at vocabulary mastery of Japanese Language.	
Technical Quality		
5.	The presented simulation on the media can help the student to comprehend the concept about matrix.	83%
6.	The sentences on the media are very clear.	
	The button locations are well-located for the students.	
Learning Quality		
7.	Media can ease the conceptual comprehension on vocabulary materials of Japanese language.	91%
8.	Media can offer opportunity to learn based on the ability.	
9.	Media has facilitated the student for autonomous learning.	
10.	Media can involve the students actively.	
Validator Percentage		
The Mean of Validity Percentage		
	Validation Criteria: Very Good/ Very Valid	**87 %**

Based on the percentage of validity results of learning media development from the material experts, it can be concluded that the "LIKARI" application is appropriate for testing in research classes after being revised based on the experts' suggestions. Then, the "LIKARI" application was also validated by Japanese Language teachers at SMA N 5 Padang to find out the appropriateness of this product for students in the class. The validation results can be seen in Table 5.

Table 5. Results of Media Validation by Teachers

No	The Evaluation Aspects	Teacher	Validity Percentage
Media Programming			
1	The ease of media use	4	100%
2	The ease of learning media menu selection	4	
3	The ease of enter and exit of learning media	4	

No	The Evaluation Aspects	Teacher	Validity Percentage
4	The accuracy of navigation button reaction	4	
Display			
5	The appropriateness of background selection	4	95%
6	The appropriateness of color selection	4	
7	The attraction of animation use	3	
8	The attraction of navigation button display use	4	
9	The appropriateness of text and picture setting	4	
Content			
10	The clarity of presented material is easy to comprehend	4	100%
11	The appropriateness of material presentation systematics	4	
12	The given exercises are in line with the learning purposes	4	
Mean			**95%**
	Validation Criteria: Very Good		

Based on the validation results from media experts and material experts, it is concluded that the "LIKARI" application is feasible or valid to be tested in classroom learning practices. Field testing was conducted to determine the practicality and effectiveness of using the "LIKARI" application on students' vocabulary skills in learning Japanese Language. Results of product practicality tests can be seen in Table 6.

Table 6. Results of Practicality Questionnaire by Teachers and Students

No	Aspects	Indicators	Practicality Percentage	
			Teacher	Student
1	Display	Learning media display is interesting Text can be read clearly The language use is easy to understand Color composition	88%	94%
2	The Ease of Use	Teacher /Student can use the media independently The button function can be operated easily.	100%	92%
3	Material Presentation	The presented materials is easy to understand The presented visualization improves the material understanding The exercises are easy to understand	92%	88%
4	Advantages	The learning media improves the learning motivation Android-based learning media can be implemented on vocabulary of Japanese Language materials and others Teacher/student is interested to use the learning media independently	92%	93%
	Practicality Mean		92%	92%
	Criteria		**Very Practical**	

From Table 6, it can be seen that the mean practicality is 92% and it is included into Criteria A scoring from 76 % - 100 %. It shows that the mobile learning application called "LIKARI" is included in the very practical qualification to use both inside and outside of the classroom. Meanwhile, the effectiveness test was analyzed by using the paired-data t test as can be seen in Table 7.

Table 7 shows a significant value for 2-tailed i.e. 0.000. Because the *sig* value (0.000) < alpha (0.05), the ability to master Japanese Language vocabulary after using the "LIKARI" application is better than before using this application. The results of data analysis show that the gain score is 73.76%. It shows that the use of the "LIKARI" application is categorized into very effective in improving the student ability to master Japanese Language vocabulary at class XI SMA N 5 Padang.

Table 7. Results of Paired-Data T Test

Pair 1 Postest - Pretest	Paired Differencence							
	Mean	Std.Devtation	Std Error Mean	95%Confidence Interval of the D		t	df	Sig-(2-talled)
	56.765	3.893	0.668	55.123	58.123	85.023	33	0.000

Discussion

Based on the results of data analysis, the developed media has been qualified to use by the Japanese Language learners. There are many factors influencing the success of development of this media by using the Borg and Gall development model. The development of this model consists of a preliminary stage to analyze the happening problems. The development is carried out by designing a product development. Next, the validation stage is conducted towards evaluation from learning media experts by 2 lecturers who are expert in learning media, 2 lecturers who are expert in material and 1 teacher teaching Japanese Language in high school. This validation is carried out to provide a comprehensive evaluation in preparation before the product is tested on a small scale or large scale. Therefore, the designed product has minimal deficiencies. Research shows that the designed Likari application media can increase students' enthusiasm for learning. In this era of the digital revolution, teachers must be able to utilize technology effectively so that students can be more interested in learning (Budiyono, 2020; Utami & Muqowim, 2020). The Likari application media is an innovation in learning. Previous research findings reveal that increasing vocabulary skills is achieved by using technology-based learning media (Gayevska & Kravtsov, 2022; Husein et al., 2017; Nadhif, 2019). Interactive multimedia directly interacts with students, supporting independent learning (Hakim et al., 2018; Putera et al., 2020; Widyaa et al., 2022). Besides that, multimedia also simultaneously contains audio and visual aspects, making the learning process more exciting and interactive (Hotimah & Muhtadi, 2018; Wulandari et al., 2019). Thus, multimedia has been proven to improve a person's learning quality in vocabulary learning, especially in Japanese. The "Likari" application provides a daily vocabulary feature so students can easily understand it.

Previous research findings also state multimedia learning can improve students' understanding and learning outcomes (Aditama, 2020; Fitrisia & Jalinus, 2019). Research confirms that learning media can improve students' vocabulary (Hamer & Rohimajaya, 2018; Taharyanti, 2017). The results of this research show that the designed *Likari* application media is to help the students learning Japanese Language. In this application, there are 1,260 vocabularies divided into 25 themes. Each theme is divided into 5 vocabularies per day. Each vocabulary contains *kanji*, *kana* letters, *romaji*, meaning, and audio to make the learning process become easier. *Likari* application can also be used both inside and outside the classroom. It also facilitates the student to study independently wherever and whenever they like. It will make students improve their Japanese Language skill. It is also because the *Likari* application is designed to provide quizzes on each given theme, so that the students can use it to study independently without having a teacher (Kuswanto & Radiansah, 2018; Lestari et al., 2017; Riyan, 2021). At the same time, it will make the student easy to comprehend the material. The implication of this research is that the media developed can be used in learning activities.

4. CONCLUSION

The The results of the data analysis show that the mobile learning application called "LIKARI" is declared very valid. It was concluded that the mobile learning application called "LIKARI" is very suitable for a mobile learning application for learning Japanese vocabulary. Using media or learning media can optimize the material delivery process to students. The mobile learning application is a learning medium that can support and optimize the learning process because it has independent and interactive criteria.

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6. REFERENCES

Aditama, P. W. (2020). Aplikasi Pembelajaran Bahasa Bali Berbasis Interaktif Multimedia. *Jurnal Bali Membangun Bali*, *1*(1), 19–26. https://doi.org/10.51172/jbmb.v1i1.105.

Amril, O., Kartika, D., Izmayanti, D. K., & Immerry, T. (2022). Bunpo: a Course in Japanese Literature With Using a Project-Based Learning Model. *Curricula : Journal of Teaching and Learning*, *7*(3), 135–145. https://doi.org/10.22216/curricula.v7i3.1533.

Arif, T. Z. Z. A. (2020). The Influences of Audio Visual Media and Vocabulary Mastery towards English Learning Achievement of EFL Students. *Journal of English for Academic Purposes*, *7*(1). https://doi.org/10.25299/jshmic.2020.vol7(1).3905.

Arthana, I. K. R., Tirtayani, L. A., Adnyani, K. E. K., & ... (2019). Penerapan Sistem Garsupati Dalam Bentuk Pengembangan Media Ajar Interaktif Bagi Guru SMA Negeri 1 Seririt dan SMP Negeri 1 Seririt. *Jurnal Widya Laksana*, *8*(1), 27–35.

Assyauqi. (2020). Moh . Iqbal Assyauqi. *Institut Agama Islam Negeri*, *December*.

Budiyono, B. (2020). Inovasi Pemanfaatan Teknologi Sebagai Media Pembelajaran di Era Revolusi 4.0. *Jurnal Kependidikan: Jurnal Hasil Penelitian dan Kajian Kepustakaan di Bidang Pendidikan, Pengajaran dan Pembelajaran*, *6*(2), 300. https://doi.org/10.33394/jk.v6i2.2475.

Criollo-C, S., Guerrero-Arias, A., Jaramillo-Alcázar, Á., & Luján-Mora, S. (2021). Mobile learning technologies for education: Benefits and pending issues. *Applied Sciences (Switzerland)*, *11*(9), 1–17. https://doi.org/10.3390/app11094111.

Dewa, I. G. S. T. A. A. S., Hermawan, G. S., & Sadyana, I. W. (2017). Pengembangan Media Pembelajaran Permainan Monopoli untuk Penguasaan Kosakata Bahasa Jepang Bagi Pemula. *Jurnal Pendidikan Bahasa Jepang*, *3*(3), 365–373.

Firmansyah, D. B., & Rahmawati, R. S. (2020). Penerapan Model Pembelajaran Panel Discussion dalam Pembelajaran Kaiwa. *Jurnal Pendidikan Bahasa dan Sastra*, *20*(1), 48–60. https://doi.org/10.17509/bs.

Fitrisia, R., & Jalinus, N. (2019). Komparasi Penggunaan Modul Cetak dengan Multimedia Interaktif Terhadap Hasil Belajar Ditinjau dari Kreativitas Siswa. *INVOTEK: Jurnal Inovasi Vokasional dan Teknologi*, *19*(2), 67–74. https://doi.org/10.24036/invotek.v19i2.307.

Gayevska, O., & Kravtsov, H. (2022). Approaches on the augmented reality application in Japanese language learning for future language teachers. *Educational Technology Quarterly*, *2022*(2), 105–114. https://doi.org/10.55056/etq.7.

Gluzman, N. A., Sibgatullina, T. V., Galushkin, A. A., & Sharonov, I. A. (2018). Forming the basics of future mathematics teachers' professionalism by means of multimedia technologies. *Eurasia Journal of Mathematics, Science and Technology Education*, *14*(5), 1621–1633. https://doi.org/10.29333/ejmste/85034.

Hakim, M. L., Asrowi, & Akhyar, M. (2018). Pengembangan Multimedia Interaktif Mata Pelajaran Bahasa Arab Materi Profesi bagi Siswa Kelas VIII SMP IT Al-Huda Wonogiri. *JTP - Jurnal Teknologi Pendidikan*, *20*(3), 249–263. https://doi.org/10.21009/jtp.v20i3.9537.

Hamer, W., & Rohimajaya, N. A. (2018). Using Flash Card as Instructional Media to Enrich the Students' Vocabulary Mastery in Learning English. *Journal of English Language Studies*, *3*(2), 167. https://doi.org/10.30870/jels.v3i2.3875.

Hotimah, H., & Muhtadi, A. (2018). Pengembangan multimedia pembelajaran interaktif IPA untuk meningkatkan pemahaman siswa pada materi Mikroorganisme SMP. *Jurnal Inovasi Teknologi Pendidikan*, *4*(2), 201–213. https://doi.org/10.21831/jitp.v4i2.15047.

Huang, D., Chueh, H., Huang, H., Ho, H., & Kao, C. (2021). Method of Information Technology Enhanced Japanese Vocabulary Learning and Evaluation. *International Journal of Emerging Technologies in Learning*, *16*(12), 233–245.

Husein, S., Herayanti, L., & Gunawan, G. (2017). Pengaruh Penggunaan Multimedia Interaktif Terhadap Penguasaan Konsep dan Keterampilan Berpikir Kritis Siswa pada Materi Suhu dan Kalor. *Jurnal Pendidikan Fisika dan Teknologi*, *1*(3), 221–225. https://doi.org/10.29303/jpft.v1i3.262.

Indah Septiani, A. nisa N. S., Septiani, I., Rejekiningsih, T., Triyanto, & Rusnaini. (2020). Development of interactive multimedia learning courseware to strengthen students' character. *European Journal of Educational Research*, *9*(3), 1267–1279. https://doi.org/10.12973/eu-jer.9.3.1267.

Indrawan, D., & Jalilah, S. R. (2021). Metode Kombinasi/Campuran Bentuk Integrasi Dalam Penelitian. *Jurnal Studi Guru dan Pembelajaran*, *4*(3), 735–739. https://doi.org/10.30605/jsgp.4.3.2021.1452.

Kartika, D., Ahadiat, E., & Astuti, Y. (2020). The Use of Audio-Lingual Method in BIPA Learning for Foreign Students in West Sumatra in the Era of the Digital Revolution. *Proceedings of the 2nd Konferensi BIPA Tahunan by Postgraduate Program of Javanese Literature and Language Education in*

Collaboration with Association of Indonesian Language and Literature Lecturers, KEBIPAAN, 9 November, 2019, Surakarta, Central Java, In, 1–6. https://doi.org/10.4108/eai.9-11-2019.2295035.

Kartika, D., Amril, O., Mardius, A., Prajana, A., Astuti, Y., & Zulbahri, Z. (2020). Pendampingan Mahasiswa terhadap Metamorfosis Pembelajaran Dimasa Pandemi Covid 19. *J-ABDIPAMAS (Jurnal Pengabdian Kepada Masyarakat)*, *4*(2), 1–8. https://doi.org/10.30734/j-abdipamas.v4i2.1281.

Kharismawati, M., Huda, I., & Setyaningsih, W. H. (2021). Solusi Strategi Pembelajaran Kosakata Bahasa Jepang Di Masa Pandemi Covid-19. *Jurnal Pendidikan Bahasa dan Sastra*, *21*(1), 95–110. https://doi.org/10.17509/bs_jpbsp.v21i1.36662.

Kuswanto, J., & Radiansah, F. (2018). Media Pembelajaran Berbasis Android Pada Mata Pelajaran Sistem Operasi Jaringan Kelas XI. *Jurnal Media Infotama*, *14*(1). https://doi.org/10.37676/jmi.v14i1.467.

Lestari, P. K. C., Sadyana, I. W., & Antartika, K. (2017). Pengembangan Aplikasi Pembelajaran Kosa Kata Jlpt Level 3 Berbasis Android Untuk Mahasiswa Jurusan Pendidikan Bahasa Jepang, Undiksha. *Jurnal Pendidikan Bahasa Jepang*, *8*(I), 11–22.

Liao, S., Hong, J.-C., Wen, M.-H., Pan, Y.-C., & Wu, Y.-. (2018). Applying Technology Acceptance Model (TAM) to explore Users' Behavioral Intention to Adopt a Performance Assessment System for E-book Production. *EURASIA Journal of Mathematics, Science and Technology Education*, *14*(10). https://doi.org/10.29333/ejmste/93575.

Lukman, M. P., Arfandy, H., & Widjaja, F. (2019). Pengembangan Sistem Pembelajaran Bahasa Jepang Berbasis Android. *SINTECH (Science and Information Technology) Journal*, *2*(1), 33–39. https://doi.org/10.31598/sintechjournal.v2i1.307.

Mohammad, R. (2018). English At Higher Education Level: A Need Analysis. *International Journal of Research in English Education (IJREE)*, *3*(2), 115–125. https://doi.org/10.29252/ijree.3.2.115.

Nadhif, M. (2019). Pengembangan Multimedia Dalam Pembelajaran Kosakata Bahasa Inggris Di SD. *Cordova Journal : language and culture studies*, *9*(1), 52–71. https://doi.org/10.20414/cordova.v9i1.1776.

Nishizawa, H., Isbell, D. R., & Suzuki, Y. (2022). Review of the Japanese-Language Proficiency Test. *Test Review: Language Testing*, *39*(3), 494–503. https://doi.org/10.1177/02655322221080898.

Parvareshbar, F., & Ghoorchaei, B. (2016). The Effect of Using Short Stories on Vocabulary Learning of Iranian EFL Learners. *Theory and Practice in Language Studies*, *6*(7), 1476. https://doi.org/10.17507/tpls.0607.20.

Putera, I. K. A., Ardyanti, A. A. A. P., Fredlina, K. Q., Sujarwo, W., Satwika, I. P., & Pharmawati, M. (2020). Perancangan Aplikasi Media Interaktif Berbasis Mobile sebagai Pengenalan Artefak Museum. *ANDHARUPA: Jurnal Desain Komunikasi Visual & Multimedia*, *6*(1), 43–62. https://doi.org/10.33633/andharupa.v6i1.2794.

Rakhimov, O. D., & Rakhimova, D. O. (2021). Educational quality in the era of globalization. *Problems of Science*, 36–39. https://doi.org/10.24411/2413-2101-2021-10101.

Riyan, M. (2021). Penggunaan Media Pembelajaran Berbasis Android Pada Pembelajaran Teks Eksposisi. *Diksi*, *29*(2), 205–216. https://doi.org/10.21831/diksi.v29i2.36614.

Sambung, D., Sihkabuden, & Ulfa, S. (2017). Pengembangan Mobile Learning Berbasis Gamifikasi untuk Penguasaan Kosakata Bahasa Jepang Kelas X SMAN 1 Garum. *Jurnal Inovasi dan Teknologi Pembelajaran*, *3*(2), 121–129.

Sari, R., Sulton, S., & Soepriyanto, Y. (2021). Pengembangan Multimedia Drill and Practice untuk Meningkatkan Kemampuan Vocabulary Bahasa Jepang. *JKTP: Jurnal Kajian Teknologi Pendidikan*, *4*(1), 1–12. https://doi.org/10.17977/um038v4i12021p001.

Shoraevna, Z. Z., Eleupanovna, Z. A., Tashkenbaevna, S. N., Zulkarnayeva, Z., Anatolevna, L. L., & Nurlanbekovna, U. A. (2021). Teachers' Views on the Use of Information and Communication Technologies (ICT) in Education Environments. *International Journal of Emerging Technologies in Learning*, *16*(3), 261–273. https://doi.org/10.3991/ijet.v16i03.18801.

Supriyono, S. (2022). Development in Education: Model Borg & Gall. *Universitas Islam Balitar*, *May*, 1–8. https://doi.org/10.13140/RG.2.2.10113.94566.

Susanti, H., & Mugiyanti, M. (2021). Korelasi Penguasaan Kosakata (Goi) dengan Kemampuan Menyimak(CHOUKAI) Mahasiswa Program Studi Sastra Jepang Fakultas Ilmu Sosial dan Ilmu Budaya Universitas Pakuan. *Media Bahasa, Sastra, dan Budaya Wahana*, *27*(1), 521–530. https://doi.org/10.33751/wahana.v27i1.4126.

Taharyanti, G. A. P. (2017). Developing Flashcards and the Manual Book for Teaching English Vocabulary for Young Learners in Singaraja. *Journal of Psychology and Instructions*, *1*(2), 71. https://doi.org/10.23887/jpai.v1i2.10362.

Timotheou, S., Miliou, O., Dimitriadis, Y., Sobrino, S. V, Giannoutsou, N., Cachia, R., Monés, A. M., & Ioannou,

A. (2022). Impacts of digital technologies on education and factors influencing schools' digital capacity and transformation: A literature review. *Education and Information Technologies*. https://doi.org/10.1007/s10639-022-11431-8.

Toliwongi, M. (2021). Strategi Pembelajaran Bahasa Jepang "Kaiwa". *Syntax Literate ; Jurnal Ilmiah Indonesia*, *6*(5), 2336–2345. https://doi.org/10.36418/syntax-literate.v6i5.2738.

Tseng, W. T., Liou, H. J., & Chu, H. C. (2020). Vocabulary learning in virtual environments: Learner autonomy and collaboration. *System*, *88*, 102190. https://doi.org/10.1016/j.system.2019.102190

Umarella, S., Rahmawati, A., & Susilowati, N. E. (2019). Interactive multimedia lectora inspire based on problem based learning: development in the optical equipment. *In Journal of Physics: Conference Series*, *1155*(1). https://doi.org/10.1088/1742-6596/1155/1/012011.

Utami, V. A., & Muqowim, M. (2020). Pengintegrasian Nilai-Nilai Keislaman Dengan Pembelajaran TIK (Teknologi Informasi dan Komunikasi) Pada Siswa Sekolah Dasar. *JEMARI (Jurnal Edukasi Madrasah Ibtidaiyah)*, *2*(2), 76–83. https://doi.org/10.30599/JEMARI.V2I2.665.

Widyaa, S., Amalia, R., & Rismayani, R. (2022). Perancangan Aplikasi Animasi Interaktif Japanese Vocabulary Berbasis Android. *Multinetics*, *8*(1), 35–41. https://doi.org/10.32722/multinetics.v8i1.4577.

Wulandari, T. A. J., Sibuea, A. M., & Siagian, S. (2019). Pengembangan Media Pembelajaran Berbasis Multimedia Interaktif Pada Mata Pelajaran Biologi. *Jurnal Teknologi Informasi & Komunikasi Dalam Pendidikan*, *5*(1), 75–86. https://doi.org/10.24114/jtikp.v5i1.12524.

Ying, Y., Marchelline, D., & Wijaya, G. (2021). Using Technology-Flashcard to Encourage Students Learning Mandarin. *Journal of Physics: Conference Series*, *1764*(1). https://doi.org/10.1088/1742-6596/1764/1/012138.