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ARTICLE

Integrating ICT In High School Japanese Language Learning: A Needs Analysis For E-Modules Development

Herniwati [1*] **, *Murni Setianingrum*** [1] **, *Nakanishi Azusa*** [2]**, *Noa Funaki*** [3]**, *Andria Pragholapati*** [4]

[1] *Department of Japanese Language Education, Universitas Pendidikan Indonesia, Bandung West Java 40154, Indonesia*

[2] *Graduate School of Humanities and Social Sciences, Hiroshima University, Higashihiroshima Hiroshima 739-8529, Japan*

[3] *International Education Department, Faculty of Education, Tokyo Gakugei University, Koganei Tokyo 184-8501, Japan*

[4] *Department of Nursing, Faculty of Sports and Health Education, Universitas Pendidikan Indonesia, Bandung West Java 40154, Indonesia*

ABSTRACT

This study analyzes the need for electronic modules (e-modules) in Japanese language learning at high schools, focusing on the integration of ICT to support independent learning. A qualitative descriptive approach was employed, with subjects consisting of Japanese language students and teachers selected through purposive sampling. Data were collected through in-depth interviews and open-ended questionnaires and analyzed using thematic analysis techniques. The findings revealed that the needs analysis for e-module development indicated a significant demand for interactive and easily accessible e-modules for students, as well as effective teaching tools for teachers. Based on the data analysis from the development stages, the results showed: 1) E-modules can be used independently and are learner-centered, 2) they are integrated with various audiovisual technologies and social media to train vocabulary, sentence patterns, and conversation skills, and 3) they are easily accessible. In the feasibility test results regarding media and content, the e-module received a "very feasible" category for use in independent Japanese language learning. During the implementation phase, feedback from educators and students in a limited trial class categorized the e-module as "excellent" for independent Japanese

*CORRESPONDING AUTHOR:

Herniwati, Department of Japanese Language Education, Universitas Pendidikan Indonesia, Bandung, West Java 40154, Indonesia;
Email: herniwati@upi.edu

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language learning. ICT integration through e-modules can enhance students' motivation and ability to learn independently while supporting teachers in the teaching process. This study provides a solid foundation for developing effective e-modules in Japanese language education in Indonesia.

Keywords: ICT Integration; Electronic Module; Independent Learning; Japanese Language

1. Introduction

The integration of information and communication technology (ICT) in education plays a vital role in supporting digital literacy and independent learning as essential 21st-century competencies. The use of digital media has become a central part of daily life, particularly for generations growing up with technology and possessing ICT literacy skills, now regarded as key competencies in various educational and professional contexts[1, 2]. ICT is considered highly beneficial in achieving educational goals[3], revolutionizing the way students learn[4]. Parents are a major supporting factor in the acquisition of ICT skills[5]. The integration of ICT in education has become increasingly important in addressing 21st-century demands that emphasize digital literacy and independent learning as essential competencies.

Learning in this century not only requires students to understand subject matter but also encourages independent learning through the utilization of various digital resources, especially during the pandemic, which restricted direct interactions between teachers and students[6]. The pandemic is seen as a critical event that has severely impacted the education sector[7]. Teachers could not maintain traditional teaching practices; new virtual spaces and reflective, alternative approaches became necessary[8]. With ICT and the use of online tools and applications, students can engage in learning outside the classroom[9–12]. The use of ICT and digital tools in learning provides innovative solutions, enabling students to continue learning effectively outside the classroom, particularly in situations where direct interaction is limited.

Use of ICT can improve learning outcomes[13]. Over the past few decades, the use of ICT in education has been a policy priority[14]. In the context of Japanese language learning at the high school level, ICT implementation supports students' autonomous learning, reflecting individual responsibility for their learning processes, as described in the characteristics of autonomous learning[15, 16]. This integration contributes to the creation of a more effective and efficient learning process in line with the needs of modern education.

Japanese language learning in Indonesia, particularly at the high school level, still faces various challenges. One of the main challenges is the lack of teaching materials that can support students' independent learning. A well-designed electronic module should facilitate students to learn independently without relying on others, provide comprehensive material, and adapt to technological advancements.

The use of e-modules in Japanese language learning at high schools has not yet been optimized, with most teachers still relying on traditional textbooks, PowerPoint presentations, and YouTube videos as primary teaching materials. However, teaching materials integrated with technology have great potential to support 21st-century learning, which demands interactivity and independent learning[17]. Previous studies have shown that e-modules can facilitate independent learning and improve student learning outcomes[18–20]. In this context, enhancing students' ability to utilize technology for learning Japanese has also become an urgent need. This study aims to analyze the needs of teachers and students for interactive and relevant e-modules as a foundation for developing effective digital teaching materials to support Japanese language learning at the high school level.

With the integration of ICT into e-modules, students are expected to become more motivated to learn Japanese and be able to study independently. Additionally, teachers will have more effective tools to teach and facilitate student learning. The integration of ICT in Japanese language learning is expected to bring positive changes to the teaching and learning process and improve the quality of education in Indonesia.

2. Materials and Methods

This research employs a Research and Development (R&D) method using the ADDIE model (Analyze, Design,

Develop, Implement, Evaluate) to develop electronic modules (e-modules) for Japanese language learning in high schools (**Figure 1**). The ADDIE model was chosen for its systematic approach and suitability for developing educational products that are effective, efficient, and engaging [21, 22].

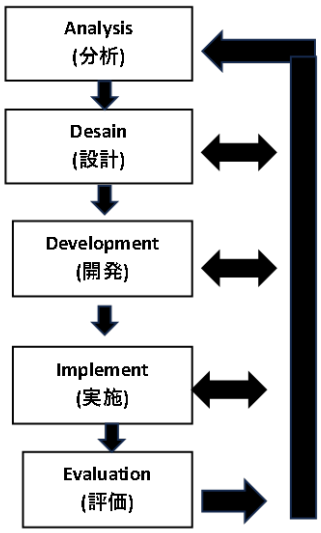

Figure 1. ADDIE development model [21].

In the analysis phase, researchers distributed open-ended questionnaires to teachers and students to identify the need for digital teaching materials and conducted material analysis based on competency achievement indicators gathered through interviews with eight educators. Literature studies were also conducted to ensure the module aligns with 21st-century learning principles.

The design phase involved creating a material framework, developing content under the curriculum, and designing interactive modules integrated with audiovisual media using Canva and Heyzine. Assessment instruments were designed to evaluate the feasibility of the module for expert validation. In the development phase, the e-modules were validated by subject matter and media experts, with revisions made based on their feedback. The improved modules were tested on a small group of students to measure initial effectiveness. The implementation phase involved distributing the modules to seven high schools in Bekasi through experimental classes, with data collected via online questionnaires to evaluate teacher and student responses to the modules. The evaluation phase included analyzing student learning outcomes from large-scale trials and gathering user feedback. This evaluation aimed to assess the impact of the e-modules in improving the quality of Japanese language learning in high schools.

The study was conducted in accordance with the Declaration of Helsinki, and approved by the Ethics Committee on Healing and Healthcare Education, a private institution (protocol code No. 108/KEP/HADHE/IV/2023). Prior to data collection, informed consent was obtained from all participants (teachers and students) after a clear explanation of the study's aims and procedures.

3. Results

A questionnaire for teachers was conducted by interviewing eight teachers who teach Japanese in grade XI to identify the challenges they are currently facing. After the interviews, the researcher proposed solutions to the identified issues. The questionnaire was then distributed to these eight teachers to determine whether they required teaching materials in the form of e-modules as a solution to these challenges. Based on the research question instrument, the results of the questionnaire are presented in **Table 1** below.

Table 1. Teacher needs analysis for teaching materials (E-Modules).

Aspect	Question Indicator	Response
Opinion on Teaching Materials (E-Modules)	1. Positive attitude towards the use of electronic teaching materials such as e-modules integrated with various media.	90% (yes)
	2. Need for e-modules as a supporting tool in Japanese language learning.	100% (yes)
	3. Need for electronic teaching materials (e-modules) to support student independence.	100% (yes)
Ability to Utilize Technology in E-Learning	4. Use of an application or platform for Japanese language learning.	100% (yes)
	5. Use of technology-based teaching materials for Japanese language learning.	90% (yes)
	6. Use of e-modules to support independent Japanese language learning.	85% (yes)

To understand students' needs for teaching materials (e-modules), an analysis of student characteristics and resource availability was conducted. Based on a questionnaire distributed to 35 students, the results are presented in **Table 2** below.

After analyzing the needs of educators and students, the 2013 curriculum was examined to understand the basic competencies and competency achievement indicators that pose challenges for students based on interviews with educators. The developed e-module focuses on basic competencies for Grade 11, Semester 2, specifically: "*3.3 Describe daily life (mainichi no seikatsu) according to its context in spoken and written transactional interaction texts, considering social functions, text structures, and linguistic elements.*" The competency achievement indicators selected include:

1. Students can describe eating and drinking habits during breakfast.
2. Students can mention transportation tools and time used when going to, arriving at, or returning from a place.
3. Students can explain daily habits with time expressions.
4. Students can describe activities done or not done in the past.
5. Students can explain clothing worn currently or planned for specific activities.

The subthemes selected for the e-module include:

1. 「あさごはんをたべます」(*Asa gohan o tabemasu*), I eat breakfast.
2. 「バスでがっこうへきます」(*Basu de gakkou e kimasu*), I come to school by bus.
3. 「まいあさ５じにおきます」(*Maiasa 5ji ni okimasu*), I wake up at 5 o'clock every morning.
4. 「きのうのよるテレビをみました」(*Kinou no yoru terebi o mimashita*), I watched TV last night. and
5. 「シャツをきています」(*Shatsu o kite imasu*) I am wearing a shirt.

After selecting submaterials, vocabulary, and sentence patterns, a literature review analysis was conducted to support e-module development.

Here is the Japanese Language E-Module Flipbook on *Mainichi no Seikatsu* (**Figure 2**), accessible at: https://heyzine.com/flip-book/9718740b23.html.

Next, the implementation phase involved product testing in a limited class setting. The findings indicate that eight educators provided evaluations, with the overall average percentage of responses to the e-module questionnaire falling into the "very good" category. The results of the limited test responses from eight teachers across eight high schools in Bekasi are presented in **Table 3**.

Table 2. Questionnaire on students' needs for electronic teaching materials (E-Modules).

Aspect	Question Indicator	Response
Student Characteristics	Have an understanding of utilizing electronic teaching materials (e-modules) in Japanese language learning.	62.9% (yes) 37.1% (no)
	Have a positive attitude toward the use of electronic teaching materials (e-modules) in Japanese language learning.	91.4% (yes) 8.6% (no)
	Have a habit of using digital resources (electronic learning materials) in Japanese language learning.	85.7% (yes) 14.3% (no)
	Show interest in using electronic teaching materials (e-modules) in Japanese language learning.	91.4% (yes) 8.6% (no)
	Show interest in using electronic teaching materials (e-modules) for fostering independent learning in Japanese language learning.	94.3% (yes) 5.7% (no)
	Have a habit of learning Japanese independently.	48.6% (yes) 51.4% (no)
Resource	Aware of applications or websites for Japanese language learning.	42.9% (yes) 57.1% (no)
	Familiar with Japanese language learning material from other books (teaching materials).	45.7% (yes) 54.3% (no)
	Own a smartphone/laptop that supports the use of electronic teaching materials in Japanese language learning.	94.3% (yes) 5.7% (no)
Understanding of Technology	Have an understanding of using smartphones/laptops with digital technology in Japanese language learning through tools like Quizizz, Canva, Google Forms, etc.	91.4% (yes) 8.6% (no)

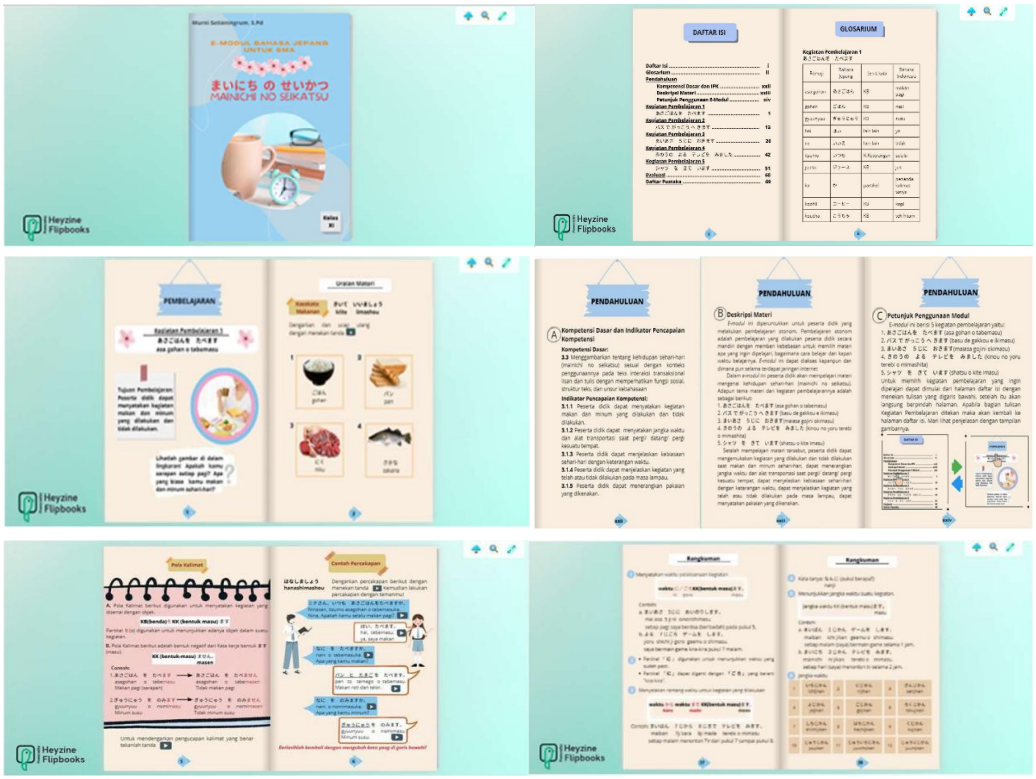

Figure 2. Design of the "*Mainichi no Seikatsu*" E-Module.

Table 3. Educators' reactions to the electronic module.

No	Educator	Percentage	Category
1	P1	96.88	Very Good
2	P2	84.38	Very Good
3	P3	100.00	Very Good
4	P4	100.00	Very Good
5	P5	100.00	Very Good
6	P6	87.50	Very Good
7	P7	81.25	Very Good
8	P8	81.25	Very Good
	Average	91.41	Very Good

The average percentage of educators' responses across all questionnaire items regarding the e-module falls into the "very good" category, at 91.41%. The e-module's presentation, enriched with various audiovisual media and simple explanatory narratives, helps students understand the material more effectively. This indicates that the e-module can serve as a teaching aid and a supplementary learning resource beyond the *Nihongo Kirakira* textbook. Moreover, the e-module is presented interactively, integrating social media for task links and quizzes. This approach aligns with the characteristics of students who are accustomed to engaging with social media and quizzes resembling games, which naturally increases their interest in independent learning.

Additionally, 30 students who participated in the small-scale or limited trial provided a response percentage of 86%, indicating that students rated the e-module as "very good" in supporting autonomous Japanese language learning. The responses from the limited trial conducted on 30 eleventh-grade students from seven high schools in Bekasi are summarized in **Table 4** below.

Table 4. Average percentage of student responses to the e-module.

No	Students	Percentage (%)	Category
1	G1	79	Good
2	G2	100	Very Good
3	G3	88	Good
4	G4	100	Very Good
5	G5	79	Good
6	G6	79	Good
7	G7	75	Good
8	G8	75	Good
9	G9	83	Very Good
10	G10	79	Very Good
11	G11	67	Good
12	G12	79	Good
13	G13	83	Very Good
14	G14	83	Very Good
15	G15	100	Very Good
16	G16	100	Very Good
17	G17	100	Very Good

Table 4. *Cont.*

No	Students	Percentage (%)	Category
18	G18	75	Good
19	G19	96	Very Good
20	G20	83	Very Good
21	G21	92	Very Good
22	G22	83	Very Good
23	G23	75	Good
24	G24	83	Very Good
25	G25	88	Very Good
26	G26	83	Very Good
27	G27	75	Good
28	G28	100	Very Good
29	G29	83	Very Good
30	G30	100	Very Good
Average		86	Very Good

4. Discussion

The analysis of teachers' needs for e-module teaching materials revealed that most teachers have a positive view of using electronic teaching materials, such as e-modules integrated with various media. This finding aligns with previous studies that suggest audiovisual media can enhance learning outcomes in vocabulary mastery [23], hiragana and katakana writing skills [24], and students' learning motivation [25]. Additionally, 100% of teachers with positive responses emphasized the need for e-modules to support Japanese language learning and foster students' independence. This aligns with the Indonesian Ministry of Education and Culture's statement that e-modules are systematic self-learning materials in electronic formats with links to related activities [26].

In general, teachers reported already using applications or platforms for teaching Japanese, indicating their capability to utilize technology. About 90% of teachers stated they had used various technology-based teaching materials for Japanese language learning, though the usage remains suboptimal as it has not fully supported students' independent learning. Based on prior interviews, many teachers still predominantly rely on PowerPoint slides from the *Nihongo Kira-kira* textbook and YouTube videos. Furthermore, survey results on the use of e-modules in Japanese language learning showed that 85% of respondents gave positive feedback.

The positive responses reflected in **Table 2** align with studies [27, 28], which state that the current generation thrives on computer games and technology, influencing their learning styles, social interaction patterns, and preferred use of technology. In today's rapid technological advancement, almost everyone possesses devices like laptops and gadgets. This is evident in the survey results, where 94.3% of students responded positively about owning smartphones or laptops that support the use of electronic teaching materials in Japanese language learning, and 91.4% indicated familiarity with using digital technology on smartphones or laptops for learning Japanese through applications such as Quizizz, Canva, and Google Forms.

However, there were also low responses contrary to these positive results. About 57.1% of students were unaware of applications or websites for learning Japanese, 54.3% did not understand materials from other textbooks, and 51.4% did not have the habit of studying Japanese independently. These results indicate that while resources are available, they do not guarantee good learning habits. Student independence does not emerge spontaneously but develops through long-term independent learning activities [29]. Thus, appropriate teaching materials are needed to support independent learning activities. Considering the current generation's characteristics, teaching materials integrated with technology and engaging elements, such as games, are required.

E-modules are effective electronic learning materials that facilitate students in independent learning [20]. Independent behavior in learning is a characteristic of autonomous learning [15, 16], which arises from frequent good learning habits. Fostering student independence and forming good learning habits require active engagement in various learning activities [16, 29]. Through autonomous learning, students can develop skills that support 21st-century education, such as information, media, and technology literacy [30]. This enables students to adapt to technological advancements, especially if learning is supported by e-modules [31].

Based on the needs analysis results, the developed e-module aligns with 21st-century skills frameworks, particularly media and ICT literacy [32]. Students become digital technology users for communication and problem-solving. This aligns with the characteristics of today's students, who are active technology users, particularly of social media and the internet. Audiovisual media can be an effective learning resource in autonomous Japanese language learning, helping students review, practice, and remember specific phrases [33]. The material presentation also aligns with findings, which highlight that Japanese language learning using video, audio, and text enhances vocabulary comprehension, memory

retention, concentration, and pronunciation focus [34].

Social media can be independently utilized by students in Japanese language learning [35]. In the developed e-module, the social media platform TikTok is used for duet conversation tasks. TikTok was chosen based on student characteristics analysis and supported by studies [36, 37], which showed that TikTok usage in Japanese language learning is more effective and improves learning outcomes. Instagram was also chosen as it is widely used by students. Yoshieda's research highlights Instagram's role in supporting language output for conversation material, which boosts student learning motivation [38].

The availability of resources makes the Internet an essential part of students' lifestyles. Through the internet, students gain not only information and entertainment but also support for independent learning. Independent learning involves students accessing content and learning resources on their own, without assistance from teachers or instructors. Independent learning through e-learning can take various forms, such as online courses, e-books, and interactive e-modules. Ernawati's research demonstrates that incorporating YouTube videos into Japanese language learning improves students' learning outcomes and motivation [39]. The exercise section of the e-module utilizes platforms like Liveworksheet, Quizizz, and Kahoot. Quiz activities support autonomous learning by enhancing students' independence in learning [16].

The student response results, with an average score of 86, fall into the "very good" category. The e-module's presentation, featuring a variety of audiovisual media, is engaging, and the simple explanations and examples of conversations make it easier for students to learn independently without relying solely on teacher explanations. These findings align with statement that in Japanese language learning, audio and text materials can enhance vocabulary comprehension, vocabulary retention, content focus, and pronunciation attention [34]. The researcher believes that students can repeatedly practice, recall, and use phrases freely according to their preferences. Additionally, students can actively participate in conversation activities through TikTok duet tasks and quizzes conducted with Kahoot, Liveworksheet, and Quizizz applications.

Integrating Information and Communication Technology (ICT) into high school Japanese language learning is a crucial step towards enhancing students' language proficiency. Research has shown that the use of ICT tools, such as chatbot-based applications integrated with social media platforms like LINE, can significantly improve basic Japanese competence among vocational high school students [40]. Additionally, studies have highlighted the importance of ICT integration in English Language Teaching (ELT) classrooms, emphasizing the benefits of technology in improving language learning outcomes and providing high-quality instruction [41].

Furthermore, the COVID-19 pandemic has accelerated the need for ICT integration in education, making online teaching and learning the "new normal" [42]. This shift has underscored the significance of understanding teachers' practices and perceptions regarding ICT use in language learning classrooms to ensure effective implementation [42]. Moreover, the success of integrating ICT in education is closely tied to school leaders' vision, understanding, and goals for ICT integration, as well as the overall school culture and background [43].

Teachers' attitudes and skills in utilizing ICT tools play a crucial role in enhancing students' English language achievements [44]. Studies have shown that when ICT is integrated into the teaching and learning process with clear instructional plans, it can offer advantages that help students learn more effectively [45]. Additionally, pre-service teachers' positive attitudes towards foreign language learning and ICT integration have been linked to improved performance in language learning and technology use [46].

In conclusion, integrating ICT into high school Japanese language learning can offer numerous benefits, including enhanced language proficiency, improved learning outcomes, and increased student engagement. Understanding teachers' perspectives, providing adequate training, and developing clear instructional plans are essential steps towards successful ICT integration in language education.

5. Conclusion

This study concludes that the integration of Information and Communication Technology (ICT) in Japanese language learning at the high school level through the use of electronic modules (e-modules) is highly needed and holds great potential for improving the quality of education. Students require interactive and easily accessible e-modules to support inde-

pendent learning, while teachers need effective tools to teach and facilitate the learning process. The e-modules developed based on this needs analysis are expected to enhance students' motivation and ability for self-directed learning while providing the necessary support for teachers. These findings provide a strong foundation for the development of effective e-modules tailored to the learning needs at the high school level and offer recommendations for implementing ICT in Japanese language education in Indonesia. The integration of ICT through e-modules is anticipated to bring positive changes to the teaching and learning process and improve the overall quality of education.

Author Contributions

Conceptualization, H. and M.S.; methodology, H.; software, M.S.; validation, H., A.P., and N.F.; formal analysis, M.S.; investigation, H.; resources, H.H.; data curation, M.S.; writing—original draft preparation, H.; writing—review and editing, A.P. and N.A.; visualization, N.F.; supervision, N.A.; project administration, H. All authors have read and agreed to the published version of the manuscript.

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Institutional Review Board Statement

The study was conducted in accordance with the Declaration of Helsinki, and approved by the Ethics Committee on Healing and Healthcare Education, a private institution (protocol code No. 108/KEP/HADHE/IV/2023, approved on April 29, 2023).

Informed Consent Statement

Informed consent was obtained from all subjects involved in the study.

Data Availability Statement

The data presented in this study are available upon reasonable request from the corresponding author. The data are not publicly available due to privacy and ethical restrictions related to participant confidentiality.

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Conflicts of Interest

The authors declare no conflict of interest.

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