Research and Analysis on Japanese Teaching Mode of Online Education under Multimedia Network Environment

Tingting Jiang

School of Foreign Languages, Zhuhai College of Science and Technology, Zhuhai 519000, Guangdong, China

Correspondence should be addressed to Tingting Jiang; jiangtingting2011@zcst.edu.cn

Received 18 August 2022; Revised 8 September 2022; Accepted 20 September 2022; Published 5 October 2022

Academic Editor: Muhammad Zakarya

Copyright © 2022 Tingting Jiang. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Japanese is among the international languages in extreme demand in the modern education system. There is a technological revolution in language learning, with blended learning (BL) in the classroom and online resources offering the possibility of autonomous learning education. The advancement of Information Communication Technology (ICT) and the development of the Internet, predominantly the Web, has transformed the way students get curriculum materials in online environments. Teaching Japanese languages has experienced crucial changes with multimedia technologies aimed at simulating a native-speaking environment in audition and oral communication. Evaluating student readiness for online learning is the beginning point for online course design using the multimedia network. Hence, this paper proposes the Multimedia Network-assisted Online Japanese Language Teaching Method (MN-OJLTM) to enhance student engagement in the online learning environment. This study identifies probabilities for better incorporation of technology and Japanese language learning and learners’ interest and desires via tactical education of Japanese online courses. This paper examines the role and influence of an intelligent learning environment of ICT multimedia in Japanese education. Experimental outcomes show that the suggested MN-OJLTM method enhances the accuracy of usage and Japanese language students’ fluency and expression in writing and speaking. The simulation outcomes demonstrate that the proposed MN-OJLTM method improves student learning ability ratio by 98.4%, language fluency level by 96.2%, performance ratio by 97.5%, student engagement ratio by 95.6%, and efficiency ratio by 97.9% compared to other popular methods.

1. Introduction to Japanese Language Teaching and Learning through Online and Multimedia Networks

Learning a second language has become more important in today’s globalized world, as graduates who are adept at functioning in multicultural or international situations are in high demand [1]. Over a 140 million people in Japan speak Japanese, a natural second language for Chinese and Korean speakers. Although China and India, two of Japan’s closest neighbors, have developed faster. Even after China, Japan is the world’s second-largest economy [2]. Innovation in Japanese language education is needed to meet the demands of today’s Internet generation, in line with the advancement of Information Communication and Technology (ICT) [3]. The Digital generation is a social generation that actively interacts, collaborates, and connects using technology in the virtual world [4]. The trend in higher education institutions is to gradually familiarize more online course modules with courses within all programs [5]. Through the comprehensive application of network technology, computer technology, information technology, big data technology, multimedia technology, virtual reality technology, etc., foreign language professional knowledge will be accurately pushed through the online form to college students based on their curriculum planning and learning needs [6]. This can help realize the rational use of foreign language learning resources, fully mobilize the interest and enthusiasm of foreign language majors in autonomous learning, enhance self-learning ability, and improve the learning effects and quality [7].
Cognitive learning theory impacts students because understanding their thought processes can help them learn. Cognitivism identifies that not all students have a similar level of cognitive abilities. Consequently, not all distance learners will progress at a similar level. Therefore, electronic learning course designers must permit individual students to sequence learning content based on how they feel fits their requirements [8]. In recent years, the Japanese teaching model based on online learning has attracted the attention of many researchers. Japanese college teachers have not fully implemented online learning due to the lack of support from intelligent technology and the poor decision-making of college management [9]. Online learning of minority languages such as Japanese requires comprehensive knowledge transfer in terms of listening, speaking, reading, writing, translating, etc. [10]. It relies on existing multimedia technology or network applet technology, which can no longer meet the online learning needs of Japanese majors [11]. Thus, it urgently needs support in the existing technical conditions, continuously increasing the introduction and in-depth application of advanced intelligent technology, and improving the technical support means and the ability for Japanese online learning in colleges [12].

Most students' interest and excitement for learning Japanese have been inspired recently by multimedia teaching technology, an Internet-based teaching approach that has improved the theoretical foundation and practical effects of language practice for college students [13–15]. The quick expansion of multimedia technology delivers more systematic, theoretical management channels and material provision basis for college Japanese and can optimize classroom structure's energy efficiency and enhance the overall teaching quality standard [16]. The training techniques for superior Japanese skills are becoming more conservative, and the teaching impact is decreasing [17]. However, multimedia technology is essential in Japanese education [18]. Comprehensive issues with multimedia auxiliary equipment application and overall progress in Japanese applied teaching levels are now a vital tie among educational institutions [19]. Therefore, it has become an essential part of Japanese professional knowledge in teaching how to obtain adequate and reasonable professional knowledge in this massive Japanese knowledge base [20]. It is based on various digital technologies, meets multiple learning needs, and ultimately promotes learning [21]. The features of this learning model include, first, rich and diverse learning content consisting of digits integrated by multimedia technology; second, some scenes in the learning process are entirely virtual, and learners can complete the study in a virtual environment; and third, the participants in the entire learning model include learners, teachers, and experts of related areas, which form the learning community [22].

The main contribution of the research is as follows:

(i) Introducing computer-assisted multimedia teaching technology in Japanese online education.

(ii) Designing the multimedia network-assisted online Japanese language teaching method (MN-OJLTM) to enhance student engagement in the online learning environment.

(iii) The experimental outcomes have been implemented, and the recommended MN-OJLTM method enhances student engagement, student learning ratio accuracy, and student fluency compared to other existing methods.

Section 2 discusses the related study on Japanese teaching, and Section 3 proposes the MN-OJLTM method for Japanese online education. In Section 4, experimental outcomes have been performed. Section 5 concludes the research article.

2. Related Study

Udjaja [23] suggested the gamification-assisted language learning (GALL) technique for the Japanese language utilizing Expert Point Cloud Recognizer. Using this strategy, students (players) can engage their sensory and motor nerve systems, encouraging them to study more. The fact that players’ abilities went from 20% to 100% is proof of this. Role-playing learning to write Japanese may be made easier by playing a role-playing game with a combat system that uses both turn-based strategy and active time battle (ATB). Many factors increase a person’s ability, and each individual has a unique set of talents. The more a person studies, the more science they can retain. One of the most important qualities of a great game is that its participants enjoy themselves while learning about science.

Asadchykh and Dybska [24] proposed the blended learning methods (BLM) for oral Japanese language teaching. This study selected four basic models of blended learning (BL) for teaching spoken Japanese: face-to-face driver, activities rotation model for second-year students, working space rotation model for third-year students, and flipped classroom model for fourth-year pupils. Students who study on their schedules or are required to catch up on specific material use the flex model, the online lab model, and the self-blend model as auxiliary models in the experiment. The self-blend model was designed to help learners who are already independent users and working to manage their own time and study independently.

Abraham et al. [25] discussed the online social networking sites (OSNS) for analyzing Japanese learners’ perceptions and attitudes toward Facebook. This paper examines whether Japanese learners consider Facebook an efficient online language-learning platform and whether this social learning method can enable learners to willingly learn English and gain experiences that aid them in better connecting with foreigners in English through social interaction. It was conducted with 88 students at the University of Toyama, Japan, to see what they thought of the efficacy of Facebook for online language study and how they felt about it. Students were chosen at random to complete a standardized questionnaire that was used to gather the data. Almost unanimously, the applicants believed that Facebook has tremendous potential for making English learning easier.
and increasing their drive and self-confidence when communicating with their peers in the language via Facebook. Miller et al. [26] recommended the content-based language teaching (CBLT) curriculum for an English for Academic Purposes (EAP) program at a Japanese university. The curriculum is designed to help learners prepare for 2 years of study at an English-speaking university. Backward design curriculum theory was merged with second language acquisition theory in an institutional environment where administrative directives and shifting learner and faculty demographics influenced how the project was implemented. The curriculum team did a requirements analysis using numerous data sources, realized the curriculum, and then showed an assessment based on different data sources. Faculty and curriculum designers were surprised by the needs analysis results, which contradicted their preconceptions. Similarly, students and teachers gave different assessments of the curriculum’s efficacy, making it impossible to conclude its effectiveness.

Kew [27] deliberated the computer game-based student response systems (CGSRS) for Japanese learners’ English language learning experience. The purpose of this article was to explore how integrating a collaborative learning strategy with Kahoot! The application affects the learning experiences of Japanese learners in an English language classroom. Japanese students’ learning outcomes were examined using an experimental research technique using a Kahoot program. The research tools in this study were a student involvement observation form and a feedback form. The population of this study was 20 Japanese learners who enrolled in an English language course and contributed to this experiment.

Based on the survey, there are several challenges to existing methods such as gamification-assisted language learning (GALL), blended learning methods (BLM), online social networking sites (OSNS), content-based language teaching (CBLT), and computer game-based student response systems (CGSRS) in achieving high student engagement, student learning ratio, accuracy, and student fluency level. Hence, in this paper, the MN-OJLTM method has been proposed.

3. Multimedia Network-Assisted Online Japanese Language Teaching Method (MN-OJLTM)

With the advent of globalization, the number of people learning foreign languages is increasing. College Japanese is an integral part of foreign language majors in colleges, and Japanese language learning is conducted in the class by a native or nonnative teacher. One primary purpose of online learning Japanese for college students using the MN-OJLTM method is to obtain more abundant Japanese learning resources. In constructing a Japanese online learning system for college students, the teaching resources for online learning should be ensured in the aspects of different types, forms, levels, perspectives, etc. The rapid development of Internet technology has dramatically changed our learning model. In addition to the ordinary learning models, online learning has become an essential way for people to learn knowledge and is widely used in university education. The emergence of the online and multimedia-based learning model significantly changed the existing teaching model. This learning model is based on Internet technology and fully uses the external environment and changes in real time.

Figure 1 shows the proposed MN-OJLTM method. Based on an open-source platform, the MN-OJLTM method uses the open-source platform for architectural and secondary advancement. Utilizing wireless network communication, the MN-OJLTM method’s entire architecture will be standardized and increase the development process efficiency. It is possible to separate the MN-OJLTM method into five distinct modules based on the hierarchical tree structure it utilizes: a module for representation, one for business logic, one for transfer, one for data service, and one for equipment. In computing, platform hardware is the actual hardware that makes up a computer and includes multimedia components like music, video, and photographs. The database serves as the realistic carrier for different logic programs.

The data collector could search and gather user history learning data, such as course data, web browsing data, user retrieval keywords, message information, exchange and interaction data, resource download records, result data, and other information to understand the user inclinations. Administrator administration, teacher management, and student management submodules may be separated into software modules to enhance the MN-OJLTM method’s overall functionality. The administrator submodule manages multimedia Japanese online education. The key role is to maintain and administer the platform and the website to guarantee its stability and the growth of instructors’ instructional engagement. When login into the multimedia Japanese online teaching using the browser for the first time, new users are required to submit their e-mail and other contact information, as well as role matching and authority division, based on the information supplied by users. Course management is a platform that allows administrators to create and remove platform function categories based on the actual Japanese teaching scenario itself.

In addition, the administrator can relocate, alter, or consequence new courses for every function, as well as the ability to restore and back up courses. One of the key functions of multimedia Japanese online teaching is the teacher management submodule, which instructors access. Providing instructors with different permission and function via the application is a main obligation of the design to facilitate educational activities. Using the multimedia network platform’s features, this research may intensively design the Japanese teaching procedure and carry out successful interactive actions to meet the goal of teaching entertainingly. Students are another key user of the student management submodule of the multimedia Japanese online education. The student management submodule has been expanded to include new features that make it easier for students to navigate the network platform, such as the ability to pick course learning, interactive course activities, online
exam responses, and personal data input. By teaching instruction in multimedia using a Japanese online teaching platform, students may debate relevant issues with instructors and other learners to carry out a series of interactive exercises that will help them enhance their learning abilities.

Figure 2 shows the important role of multimedia networks in Japanese teaching. Multimedia technology defines computer-based, interactive applications that permit people to communicate ideas and data with animations, video, audio, images, and digital print components. Students’ learning foundation, accepting ability, and cognitive traits may be improved by increasing the overall quality of the students in this research. Students’ potential and creativity may be efficiently simulated by multimedia networks, which can completely activate students’ attention, passion, and determination. This research can potentially promote the development of students’ personalities in a way that any other educational approach cannot match. A contemporary learning environment cannot be realized without a network resource. Students may develop clearer cognitive norms by connecting multilevel knowledge resources, communication, and multibranch organization. Using multimedia networks, students may more readily practice Japanese speaking, listening, reading, translation, writing, and other language abilities. Student learning occurs when they independently explore and discover new information while guided by knowledgeable instructors. Teaching is an intentional, well-thought-out, and well-executed endeavor to foster students’ knowledge growth. Students’ learning capacities may be cultivated by using multimedia networks.

To sum up, the complete method of multimedia Japanese online teaching is preliminarily intended to utilize wireless network communication. Every functional module is examined and intended in point based on this framework. A preparation decision-making objective is set as \( N_a \), and expressions

\[
N_a = X_y + P_w. 
\]  

(1)

As shown in equation (1), where \( X_y \) denotes the influencing factor and \( P_w \) indicates the crucial data of \( X_y \).
respective to the preparation goals. Owing to the variance in influence degree of impact factors on targets \( N_m \), it is essential to associate the influence degree, and the comparison outcomes can be articulated by \( C \) matrices:

\[
C = \begin{bmatrix}
c_{11} & c_{12} & \ldots & c_{1n} \\
c_{21} & c_{22} & \ldots & c_{2n} \\
\vdots & \vdots & \ddots & \vdots \\
c_{n1} & c_{n2} & \ldots & c_{nn}
\end{bmatrix}
\]  

(2)

As inferred from equation (2), \( c_{nn} \) signifies the influence degree co-efficient in rows \( n \) and columns \( n \). Let us assume that matrices \( C \) fulfill the consistency state, then the respective solution to the eigenvalue issue:

\[
C' = c_{nm} \times R_v.
\]

(3)

As discussed in equation (3), \( R_v \) denotes the fuzzy comprehensive assessment coefficient. The fuzzy comprehensive assessment technique is a statistical assessment technique. It creates a precise, objective, and practical multimedia Japanese online teaching assessment to resolve the issues in the teaching process efficiently. The comprehensive fuzzy assessment gives priority to gathering materials for the precise assessment of multimedia Japanese online teaching and identifying the primary grades and factors of appraisal; then, the weight distributions of the online teaching assessment index are identified by the analytic hierarchy process (AHP), and the fuzzy statistical model is developed. Supposing that the AHP is utilized to identify the weight, the assessment domain-level models:

\[
B = (b_1, b_2, \ldots, b_m).
\]

(4)

As found in equation (4), \( b_1, b_2, \ldots, b_m \) symbolize the assessment grade coefficient. The teaching quality assessment outcomes of diverse instructors are attained via assessment domain-level models, and the respective advancement measures are provided in time united with the assessment outcomes to guarantee the efficient development of the quality of the multimedia Japanese online teaching to comprehensive the design of the multimedia Japanese online teaching under the ICT.

To reflect the importance of the online learning ability evaluation index for Japanese learners in different colleges, this paper utilizes the analytic hierarchy process (AHP) method to obtain the weights of the Japanese online learning ability evaluation index. Experts in the field have been invited to evaluate and score the significance of the assessment index using the same metrics, thereby obtaining the initial judgment matrix \( A \) for the evaluation index:

\[
A = [a_{ji}]_{m \times m}.
\]

(5)

As shown in the above formula, \( a_{ji} \) denotes the importance of the evaluation index \( j \) relative to \( i \), which is generally measured in the form of a 1:9 ratio, and satisfies \( a_{ji} = 1/a_{ji}; \) and \( m \) denotes the number of evaluation indexes.

To determine the maximum characteristic root \( \lambda (A) \) of initial judgment matrices, the consistency index \( CI \) can be computed as in

\[
CI = \frac{(\lambda (A) - m)}{m - 1}.
\]

(6)

According to the number \( m \) of evaluation indicators, the relevant tables have been inquired to obtain the value of the consistency index. Then, the consistency ratio \( CR \) is computed as:

\[
CR = \frac{CI}{CR'}.
\]

(7)

If satisfying \( CR < 0.1 \), it means that the initial judgment matrix \( A \) encounters the consistency requirement, and the weight \( w_i \) of the evaluation index \( j \) for Japanese online
learning ability among college students can be determined as in equation (8).

\[ s_j = \frac{\sum_{i=1}^{m} a_{ji}}{\sum_{j=1}^{m} \sum_{i=1}^{m} a_{ji}}. \] (8)

Thus, the weight sequence S of the evaluation index for all college students is given as:

\[ S = [s_1, \ldots, s_j, \ldots, s_m]. \] (9)

As shown in equation (9), \( s_m \) denotes evaluation indicators.

Figure 3 shows the cognitive theory of multimedia learning in Japanese language teaching. Applying cognitive theory is the innovative utilization of multimedia technology to establish interaction components that support scenario-based training. These simple multimedia interactions support modern notions and unite with other interactive components to create more difficult integrated practical exercises in Japanese teaching. Japanese instructors utilize slides to aid students in learning and understanding Japanese vocabulary in class. Learners’ attitudes and retention suffer due to the instructors’ inexperience with modern forms of information and communication technology (ICT). Many instructors in the classroom utilized ICT and projected Japanese language terms. Students’ attention will be diverted in one way or another by ICT. A lack of technical expertise among many instructors has prevented them from making the most of the benefits of acquiring the Japanese language. Using these instructional control slides does not add to student learning results since they do not consider multimedia’s benefits. The cognitive theory of multimedia learning (CTML) uses temporal contiguity and multimedia principles. This approach aims to emphasize technology and shift away from the negative perception of Japanese as a boring language. Otherwise, it is vital to serve as a guide or valuable data for other Japanese curriculum instructors to review their teaching style while directing Japanese vocabulary sessions to enhance the quality of teaching. Learning in multimedia environments is based on five cognitive theories (CTML).

In the first step, the phonological loops, graphic, and spatial sketch are included in the presentation. When selecting words and images, sensory memory has a limited capacity. Thirdly, significant learning happens when appropriate data are gathered and processed into logical presentation structures. As a fourth step, the visual depiction in working memory and the verbal utterance are linked together. Narration and graphic images develop mental representations in words and pictures, which may be used in conjunction with past information to create new understandings.

Figure 4 shows the listening and speaking exercise model for Japanese teaching. While studying Japanese utilizing an existing computer and mobile application or platform, this study perceived their task performance and noted any problems teachers encountered. During the improvement stage, this study divided the method into a client side for the application on interactive devices and the server side for the backend information engine based on visions collected in the prerequisite analysis stage. According to user stories, this application’s critical feature is transforming user speeches into part of learning interaction. Audio (student’s speech) has been converted into texts by Text-To-Speech (TTS) that uses application programming interface (API) and vice versa. After gathering information, this research adopted expressive statistics to analyze the assessment outcomes of learning results through the database. Teachers navigate the quiz segment and get the score by responding to the question based on the learning material. Firebase authentication aims to make it simple for developers to create secure authentication systems while enhancing end customers’ sign-in and onboarding experience. As a complete identification solution, it works with both e-mail and password accounts and phone verification.

Figure 5 shows the multimedia-enhanced instructional communication process. Teachers may utilize multimedia to convey knowledge in various ways, including voice, text, animation, video, and graphics. Using a variety of media enhances the learning experience and helps students remember what they have been taught longer. When teachers incorporate multimedia into their teaching process, the
Educational material and multimedia technology will be integrated into one. The combination of technology and content will generate multisensory multimedia content applications, visually difficult, and interactive. Many multimedia creation software programs simplify developing these kinds of interactive multimedia content. The conventional instructional communication process (ICP) is a paradigm that transfers data from the resource (or sender) to the receiver through a delivery or transmission medium to provide data. As a result, the final interactive content that is developed may be offered to the learner in different ways and made accessible for various teachings and learning modes, like student centered, teacher centered, and mixed modes. As a result, adding multimedia to the teaching and learning progression and delivery systems will help educational organizations meet the growing demands of the 21st century society. This paper presents the MN-OJLTM method for enhancing student engagement in Japanese online teaching. Computer-assisted multimedia technology in Japanese online education has been introduced. The help of cognitive theory occupies a vital role in a student’s overall development, as they include the brain’s core functions like learning, thinking, retaining data, reading, and paying attention and are utilized to resolve problems, recollect tasks, and make a decision. Analytic hierarchy process has been employed for evaluating the student score in Japanese online learning using multimedia technology. The proposed MN-OJLTM method enhances the student learning ability, language fluency, performance ratio,
student engagement ratio, and efficiency ratio compared to other existing methods.

4. Experimental Outcome

This paper presents the MN-OJLTM method for enhancing student engagement in Japanese online teaching. This study used the dataset https://www.oecd.org/education/database.htm [28] to analyze the performance metrics of the proposed MN-OJLTM method. Online Education Database (OECD) developed a developing statistics dataset, including the indicators published in Education at a Glance. Values can be searched by year, country, and subject. Complementary to these datasets, trend indicator sequences are available. This online dataset may not always be equivalent because of changes in descriptions and coverage made due to meetings with OECD countries. In this dataset, everyone can access Education at Glance indicators. Furthermore, student learning ability, student language fluency, performance ratio, student engagement ratio, and efficiency ratio have been discussed in this section.

4.1. Student Learning Ability. The subsystem of multimedia learning management and its related functions of this proposed MN-OJLTM method is set for learners, which can achieve many personalized tasks for learners. Learners can choose the learning content and speed according to their needs and ability. Thus, the needs of different learners can be met, providing great convenience for the learners. The online learning resources of the Japanese language for college students are enriched from the professional, practical, theoretical, and other perspectives of college Japanese. For example, set up professional courses based on Japanese grammar and professional knowledge points; open practical courses or academic courses that better trigger students’ interest in learning; and cultivate students’ language practice ability or theoretical learning ability. The proposed MN-OJLTM method’s learning ability can be identified using equation (2). The proposed MN-OJLTM method achieves high student learning ability by 98.4% compared to other existing models. Figure 6 shows the student learning ability ratio.

4.2. Student Language Fluency Level. This research proposes using listening and speaking exercises in the E-learning application of Japanese language learning to give learners a novel experience. The results of a small-scale study on E-learning students employing spoken input are included in this paper. Using speech recognition for speaking activities in an online Japanese language learning application has increased the effectiveness of multimedia interaction as a learning tool. This study aims to present the concept of communicative online learning to give users an intuitive speaking experience. Student language fluency level has been calculated using equation (3). The suggested MN-OJLTM method attains the student language fluency level by 96.2% compared to other existing methods. The student language fluency level is shown in Figure 7.

4.3. Performance Ratio of MN-OJLTM Method. The problems existing in the online learning of Japanese among college students were discussed from different aspects, such as platform professionalism and practicality, online learning, resource planning, online learning management, and performance evaluation, and the impacts of these factors on the cultivation of Japanese learning ability were analyzed. New information technology allows offline and online hybrid teaching to be the education and teaching technique of the pandemic age, creating new opportunities for higher education reform in the next generation. The performance ratio has been calculated using equation (4). The suggested MN-OJLTM method achieves a high-performance ratio of 97.5% compared to other existing methods. Tests, quizzes, and graded Japanese course activities measure student performance. Figure 8 illustrates the performance ratio.
4.4. Student Engagement Ratio. An important aspect of a good supplemental online course was the development of a scholarly attitude to learning, participation in a learning community, and the online component that helped students proceed through the course. E-learning offers new ways to get students involved and more options than the more traditional teaching methods. It is possible to engage students and processes in E-learning by providing them with features like ease of use and accessibility and a lower overall cost. This research has shown that engaging learners in the online Japanese learning process improve their attention and focus, motivates them to promote meaningful learning experiences, and practice higher-level critical thinking skills. The engagement ratio has been calculated using equation (5). The suggested MN-OJLTM method achieves a high student engagement ratio of 95.6% compared to other existing approaches. Figure 9 signifies the student engagement ratio.

4.5. Efficiency Ratio of MN-OJLTM Method. Compared to conventional classroom teaching, multimedia technology may ultimately mobilize learners’ listening, reading, speaking, and writing all-round senses of classroom experience and the effectiveness of data interaction. The fast advancement of multimedia technology offers a more systematic, theoretical, guiding channels and material aid base for university Japanese and may optimize the energy efficiency of classroom structures and enhance the total standard of teaching. In a classroom utilizing multimedia courseware, pupils can better listen and retain information since they are not distracted by taking notes or trying to copy it from the instructor. It evades other complex links and enhances learners’ knowledge-sharing effectiveness. Equations (8) and (9) demonstrate the efficiency ratio of the suggested technique. The suggested MN-OJLTM method attains a high-efficiency ratio of 97.9% compared to other existing models. Figure 10 signifies the efficiency ratio.

The proposed MN-OJLTM method enhances the student learning ability, student language fluency, performance ratio, student engagement ratio, and efficiency ratio compared to other existing methods: gamification-assisted language learning (GALL), blended learning methods (BLM), online social networking sites (OSNS), content-based language teaching (CBLT), computer game-based student response systems (CGSRS).

5. Conclusion

This study presents the MN-OJLTM method to enhance student engagement in the online learning environment. Studying a foreign language has never improved, thanks to
the tremendous benefits of modern information and network technologies. New techniques of instruction may be derived from the material being taught. Teaching Japanese as a professional language requires a combination of technology and information resources that may be used to expand the understanding of Japanese language talents and improve the overall quality of Japanese language professionals. The prompt advancement of multimedia network technology has promoted rapid change in the Japanese language teaching model. Japanese language teaching should conform to the development of the online teaching model and fully use multimedia network technology’s advantages, providing diverse, modernized, and personalized teaching services to learners to meet the necessities of the new era. The experimental outcomes demonstrate that the proposed MN-OJLTM method improves student learning ability ratio by 98.4%, language fluency level by 96.2%, performance ratio by 97.5%, student engagement ratio by 95.6%, and efficiency ratio by 97.9% compared to other popular methods. Several multimedia-teaching issues must be addressed immediately. For example, PPT-oriented Japanese class leads to information overlapping and time wastage due to the inappropriate design of courseware that stimulates attention and disruption. The evaluation result indicates that the MN-OJLTM is achievable for future mobile and online learning implementation with good learning result improvement compared to the traditional learning technique. Online open courses will become essential content of future education reforms.

Data Availability

The data of this study can be obtained from the author upon request.

Conflicts of Interest

The author declares that there are no conflicts of interest.

References

[1] M. S. M. Ayub, O. Talib, and N. M. Siew, “The perceptions of users regarding multimedia principles in mobile-based Japanese language learning,” Turkish Online Journal of Educational Technology-TOJET, vol. 17, no. 3, pp. 113–124, 2018.

[2] N. Imelda and R. Aceng, “Online learning: enhancing communicative-based Japanese competence through zoom and aizuchi skill-based multimedia,” Turkish Journal of Computer and Mathematics Education (TURCOMAT), vol. 12, no. 13, pp. 5741–5749, 2021.

[3] N. Kaur, N. A. Othman, and H. W. Adli, “The development of a multimedia application in learning Japanese,” Journal of Emerging Economies and Islamic Research, vol. 8, no. 3, pp. 40–61, 2020.

[4] D. B. Firmansyah, R. S. Rahmawati, and A. Q. Tanzil, “Instructional media development for teaching Japanese language,” Journal of Education Research and Evaluation, vol. 2, no. 2, pp. 89–98, 2018.

[5] D. Jin and Y. Li, “A teaching model for college learners of Japanese based on online learning,” International Journal of Emerging Technologies in Learning (iJET), vol. 15, no. 15, pp. 162–175, 2020.

[6] J. Wang, T. Mendori, and T. Hoel, “Strategies for multimedia learning object recommendation in a language learning support system: verbal learners vs. visual learners,” International Journal of Human-Computer Interaction, vol. 35, no. 4–5, pp. 345–355, 2019.

[7] S. Ge, C. Hai Leng, and S. M. Baharudin, “The effect of multimedia and temporal contiguity principles on students’ attitude and retention in learning Japanese language,” International Journal of Chinese Education, vol. 11, no. 2, Article ID 2212585X2210999, 2022.

[8] Z. Stanković, J. Maksimović, and J. Osmanović, “Cognitive theories and paradigmatic research posts in the function of multimedia teaching and learning,” International Journal of Cognitive Research in Science, Engineering and Education, vol. 6, no. 2, pp. 107–114, 2018.

[9] K. C. Brata and A. H. Brata, “User experience improvement of Japanese language mobile learning application through mental model and A/B testing,” International Journal of Electrical and Computer Engineering, vol. 10, no. 3, p. 2659, 2020.

[10] Y. Li, “Study on the application of computer network resources in Japanese teaching,” in Journal of Physics: Conference Series, vol. 1992, no. 3, p. 32071, IOP Publishing, 2021.

[11] H. T. Hoi, “The current status of learning Japanese online of Vietnamese students,” International journal of scientific & technology research, vol. 9, no. 2, pp. 1997–2001, 2020.

[12] N. Cowie and K. Sakui, “Learning English through digital projects: a Japanese university case study,” Osaka JALT Journal, vol. 5, pp. 20–43, 2018.

[13] A. Tanjung, “Making Japanese language learning models through multimedia-based SCL implementation,” Journal polingua: scientific journal of linguistic literatura and education, vol. 7, no. 2, pp. 27–31, 2019.

[14] Z. Lv and H. Song, “Trust mechanism of feedback trust weight in multimedia network,” ACM Transactions on Multimedia Computing, Communications, and Applications, vol. 17, no. 4, pp. 1–26, 2021.

[15] M. H. Shafabadi, Z. Ahmadi and M. R. Esfandyari, Solving the problem of target k-coverage in WSNs using fuzzy clustering algorithm,” Journal of Intelligent Systems and Internet of Things, vol. 2, no. 2, pp. 55–76, 2021.

[16] M. Tian and Y. Sun, “Research on the application of computer aided multimedia teaching technology in Japanese teaching,” in Journal of Physics: Conference Series, vol. 1744, no. 3, IOP Publishing, Article ID 32188, 2021.

[17] K. Rockell, “Music (s) of the world as an online EFL resource: a Japanese EFL classroom experience,” Englisia: Journal of Language, Education, and Humanities, vol. 7, no. 2, pp. 102–115, 2020.

[18] D. H. Huang, H. E. Chueh, H. T. Huang, H. F. Ho, and C. Y. Kao, “Method of information technology enhanced multimedia teaching and learning object recommendation in a language learning,” Journal of Physics: Conference Series, vol. 10, no. 3, p. 2659, 2020.

[19] Z. Stanković, J. Maksimović, and J. Osmanović, “Cognitive theories and paradigmatic research posts in the function of multimedia teaching and learning,” International Journal of Cognitive Research in Science, Engineering and Education, vol. 6, no. 2, pp. 107–114, 2018.

[20] K. C. Brata and A. H. Brata, “User experience improvement of Japanese language mobile learning application through mental model and A/B testing,” International Journal of Electrical and Computer Engineering, vol. 10, no. 3, p. 2659, 2020.

[21] Y. Li, “Study on the application of computer network resources in Japanese teaching,” in Journal of Physics: Conference Series, vol. 1992, no. 3, p. 32071, IOP Publishing, 2021.

[22] H. T. Hoi, “The current status of learning Japanese online of Vietnamese students,” International journal of scientific & technology research, vol. 9, no. 2, pp. 1997–2001, 2020.

[23] N. Cowie and K. Sakui, “Learning English through digital projects: a Japanese university case study,” Osaka JALT Journal, vol. 5, pp. 20–43, 2018.

[24] A. Tanjung, “Making Japanese language learning models through multimedia-based SCL implementation,” Journal polingua: scientific journal of linguistic literatura and education, vol. 7, no. 2, pp. 27–31, 2019.

[25] Z. Lv and H. Song, “Trust mechanism of feedback trust weight in multimedia network,” ACM Transactions on Multimedia Computing, Communications, and Applications, vol. 17, no. 4, pp. 1–26, 2021.

[26] M. H. Shafabadi, Z. Ahmadi and M. R. Esfandyari, Solving the problem of target k-coverage in WSNs using fuzzy clustering algorithm,” Journal of Intelligent Systems and Internet of Things, vol. 2, no. 2, pp. 55–76, 2021.

[27] M. Tian and Y. Sun, “Research on the application of computer aided multimedia teaching technology in Japanese teaching,” in Journal of Physics: Conference Series, vol. 1744, no. 3, IOP Publishing, Article ID 32188, 2021.

[28] K. Rockell, “Music (s) of the world as an online EFL resource: a Japanese EFL classroom experience,” Englisia: Journal of Language, Education, and Humanities, vol. 7, no. 2, pp. 102–115, 2020.

[29] D. H. Huang, H. E. Chueh, H. T. Huang, H. F. Ho, and C. Y. Kao, “Method of information technology enhanced multimedia teaching and learning object recommendation in a language learning,” Journal of Physics: Conference Series, vol. 10, no. 3, p. 2659, 2020.
online English learning resources as an example,” *Smart Learning Environments*, vol. 7, no. 1, p. 24, 2020.

[21] Y. Qiao, "Research on the course construction of "Japanese extensive reading" based on the multimedia under the background of micro-class," in *Journal of Physics: Conference Series*, vol. 1744, no. 4, p. 42096, IOP Publishing, 2021, February.

[22] N. T. Danh, "Sustainable education: teaching and learning primary Japanese language," in *Proceedings of the E3S Web of Conferences*, vol. 295, EDP Sciences, Article ID 5030, July 2021.

[23] Y. Udjaja, "Gamification assisted language learning for Japanese language using expert point cloud recognizer," *International Journal of Computer Games Technology*, pp. 1–12, 2018.

[24] O. Asadchih and T. Dybska, “The experimental testing of blended learning methods of oral Japanese language teaching aimed at future philologists,” *Science: Pedagogical Education*, vol. 3, no. 36, pp. 58–61, 2020.

[25] S. Abrahim, B. A. Mir, H. Suhara, and M. Sato, "Exploring Academic use of online social networking sites (SNS) for language learning: Japanese students’ perceptions and attitudes towards Facebook," *Journal of Information Technology & Software Engineering*, vol. 8, no. 1, pp. 1–5, 2018.

[26] L. R. Miller, K. Klassen, and J. W. Hardy, “Curriculum design from theory to practice: preparing Japanese students to study abroad using content-based language teaching,” *Curriculum Journal*, vol. 32, no. 2, pp. 215–246, 2021.

[27] S. N. Kew, "Japanese students’ English language learning experience through computer game-based student response systems,” *Turkish Journal of Computer and Mathematics Education (TURCOMAT)*, vol. 12, no. 3, pp. 1993–1998, 2021.