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Deep Learning Based Instruction for Enhancing Japanese Speaking Skills in Senior High School

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Abstract

This study investigates the effectiveness of the Deep Learning approach, an educational approach that emphasizes meaningful, mindful, and joyful learning to promote active student engagement and deeper understanding, in improving Japanese speaking skills among senior high school students. The population of this study consisted of 432 eleventh grade students at SMAN 1 Sumedang. The sample was selected using simple random sampling, resulting in 72 students divided into 36 students in the experimental class and 36 students in the control class. This study employed a true experimental design using a pretest–posttest control group design. The results obtained from the Independent Samples t-test on the post-test scores of both classes showed a significance value of $p < 0.001$, indicating that the Deep Learning approach was proven to be effective in improving the Japanese speaking skills of eleventh grade students at SMAN 1 Sumedang, particularly in pronunciation, grammar, vocabulary, fluency, and comprehension.

Keywords: Deep Learning; Japanese Speaking Skills; Japanese Language Education

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1. Introduction

The rapid development of science, technology, and globalization has transformed the demands placed upon education systems worldwide. Contemporary societies require individuals who are adaptable, resilient, critical thinkers, effective communicators, and lifelong learners capable of addressing complex and unpredictable challenges. Consequently, educational institutions are expected not only to transfer knowledge but also to develop higher order thinking skills, creativity, collaboration, communication, and problem solving abilities

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among learners. These competencies are widely recognized as essential twenty first century skills that enable students to thrive in increasingly dynamic social and professional environments (Asrizal, et al, 2018; Sugiman, 2023).

Despite significant improvements in educational access, the quality of education in Indonesia remains a major concern. Results from the Programme for International Student Assessment (PISA) 2022 revealed that Indonesian students continue to perform below the international average in reading, mathematics, and science literacy (OECD, 2023). Furthermore, less than one percent of Indonesian students demonstrated the ability to solve Higher Order Thinking Skills (HOTS) tasks requiring analysis, evaluation, and complex problem solving. These findings indicate the urgent need for instructional approaches that move beyond rote memorization and teacher centered learning toward meaningful and student centered learning experiences. This need is also relevant to foreign language education, including Japanese language learning, particularly speaking instruction. Japanese speaking proficiency requires students not only to recall vocabulary and grammatical structures but also to understand meaning, formulate and express ideas, respond appropriately, and communicate fluently in meaningful contexts. Therefore, Japanese speaking instruction should provide opportunities for students to actively process language, apply their knowledge in communicative situations, and reflect on their learning rather than merely memorize linguistic forms.

In response to these challenges, the Indonesian Ministry of Primary and Secondary Education (Kemendikdasmen RI, 2025) has introduced Deep Learning as a pedagogical approach that emphasizes meaningful understanding, critical thinking, reflection, collaboration, and authentic learning experiences. Unlike artificial intelligence-related deep learning, this educational approach focuses on enabling learners to construct deeper understanding and apply knowledge in real life contexts. It is aligned with the principles of learner autonomy and project-based learning promoted in the Merdeka Curriculum. Internationally, comparable educational principles can be found in Norway's national curriculum, which emphasizes critical thinking, learning to learn, and the development of competencies for lifelong learning (Ministry of Education and Research, 2017). These principles share common ground with Indonesia's Deep Learning approach, particularly in promoting meaningful learning and the application of knowledge beyond the classroom.

The Deep Learning framework consists of four interconnected components : the learning environment, learning principles, learning experiences, and graduate profile dimensions (Kemendikdasmen RI, 2025). Its three core principles are mindful, meaningful, and joyful learning. Mindful learning encourages students to develop awareness of their learning goals, prior knowledge, language use, and learning progress. Meaningful learning connects learning materials with students everyday experiences and provides opportunities for purposeful communication, while joyful learning promotes active participation through collaborative, interactive, and engaging activities. In Japanese speaking instruction, these principles encourage students to explore, practice, apply, and reflect on language use, particularly in pronunciation, grammar, vocabulary, fluency, and comprehension. The framework also aims to develop essential competencies, including critical thinking, creativity, communication, collaboration, independence, citizenship, faith and piety, and health awareness.

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By integrating supportive learning environments, learning partnerships, and digital technology, Deep Learning is intended to foster active participation and lifelong learning.

From a theoretical perspective, Deep Learning promotes deeper cognitive engagement by connecting conceptual and procedural knowledge while encouraging learners to apply their understanding in novel situations. Kolb's (1984) experiential learning theory supports the principles of Deep Learning by emphasizing that knowledge is created through the transformation of experience involving reflection, conceptualization, and experimentation. Similarly, Biggs and Moore (1993), through their 3P Model (Presage–Process–Product), explain that learning outcomes are influenced by students' prior characteristics, learning processes, and learning products. In the process dimension, deep learning is characterized by intrinsic motivation and active engagement, in which learners seek to understand concepts critically and meaningfully, whereas surface learning is primarily driven by external motivation and memorization without conceptual understanding. The product dimension emphasizes learners' ability to apply knowledge and skills in various contexts, highlighting the importance of meaningful learning environments that encourage reflection and independent learning. Furthermore, Hattie and Donoghue (2016) argue that Deep Learning fosters critical thinking, creativity, and problem-solving skills through meaningful learning experiences. Therefore, Deep Learning encourages students to construct knowledge actively through authentic experiences and apply their understanding to real life situations.

Recent studies have reported positive outcomes associated with the implementation of Deep Learning in various educational contexts. Kadarismanto (2025) found that Deep Learning significantly enhances conceptual understanding, critical thinking, and problem solving abilities among students. Khotimah et al. (2025) reported increased student engagement, participation, and reflective thinking in Islamic Education classes following the implementation of Deep Learning. Likewise, Epik et al. (2025) demonstrated that the approach improved literacy skills among elementary school students, while Fatmawati (2025) highlighted its effectiveness in making history learning more contextual and meaningful through digital integration. These studies indicate that Deep Learning can support active engagement, deeper understanding, reflection, and the application of knowledge across different subject areas. Such characteristics are particularly relevant to foreign language learning, where students need to move beyond memorizing vocabulary and grammatical structures toward using language meaningfully in communicative contexts. In Japanese language learning, this is especially important for developing speaking proficiency, as students are expected to understand and produce language, respond appropriately, and communicate with fluency in meaningful situations. However, empirical evidence on the implementation of Deep Learning specifically for Japanese speaking instruction at the senior high school level remains limited.

In foreign language education, communication competence is one of the most important learning objectives. Among the four language skills : listening, speaking, reading, and writing, speaking is often regarded as the most challenging because it requires learners to simultaneously utilize vocabulary, grammar, pronunciation, and communicative strategies in real-time interactions. In the context of Japanese language education, several studies have identified persistent difficulties in speaking proficiency. Aji et al. (2018), revealed that learners often struggle with vocabulary limitations, grammatical accuracy, and lack of confidence when

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speaking Japanese. Sukmara et al. (2023) also demonstrated that role-play-based instruction can support the improvement of Japanese speaking skills by encouraging active participation and providing opportunities for students to practice Japanese communication in simulated situations. More recently, Shabdasi (2025) found that speaking was the most difficult language skill for Indonesian senior high school students learning Japanese. These findings collectively indicate that Japanese speaking proficiency remains a significant challenge for learners and requires more meaningful and engaging instructional approaches.

Although previous studies have demonstrated the benefits of Deep Learning in improving educational outcomes, most existing research has focused on subjects such as religious education, science, social studies, literacy, and history. Few studies have investigated the implementation of Deep Learning in foreign language education, particularly in Japanese language learning at the senior high school level. Moreover, limited research has examined how Deep Learning can be utilized to improve Japanese speaking skills, particulary in terms of pronunciation, grammar, vocabulary, fluency, and comprehension, despite the growing importance of communicative competence in twenty first century language education.

Therefore, this study aims to investigate the implementation of the Deep Learning approach in Japanese language learning and its effectiveness in improving students' speaking skills. Specifically, this study examines students' speaking performance before and after the implementation of the Deep Learning approach and determines whether there is a significant difference between students taught through the Deep Learning approach and those receiving conventional instruction. Using a pretest–posttest control group design, this study aims to provide empirical evidence regarding the effectiveness of Deep Learning in improving Japanese speaking skills and to contribute to the development of innovative and meaningful foreign language learning practices in Indonesian secondary education.

2. Methods

2.1 Research Design

This study employed a true experimental research design. According to Ratminingsih (2010), experimental research aims to determine the causal relationship between two phenomena. The research design used in this study was the Pretest–Posttest Control Group Design. The study involved two groups, namely an experimental group and a control group. The experimental class received instruction through the Deep Learning approach, while the control class received conventional instruction using teacher led lecture and role play activities. During the conventional instruction, the teacher explained vocabulary, grammatical patterns, and language expressions related to the learning materials, followed by question-and-answer sessions and guided exercises. Students then practiced the target language through structured role-play based on predetermined dialogues or situations provided by the teacher. Both groups were administered the same pre-test and post-test to measure students' Japanese speaking skills before and after the treatment.

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2.2 Population and Sample

The population of this study consisted of 432 eleventh grade students of SMAN 1 Sumedang distributed across several classes. Since the research participants were selected as intact classes rather than an individual students, cluster random sampling was employed. From the available eleventh grade classes, two classes were randomly selected as the research sample : Class XI-10 as the experimental group and Class XI-11 as the control group. Each class consisted of 36 students, resulting in a total sample of 72 students. Thus, the sampling procedure involved selecting entire classes as clusters, rather than individually selecting 72 students from the total population of 432 students.

2.3 Data Collection Method

Data collection was conducted through speaking tests administered as a pre-test before the treatment and as a post-test after the treatment. The treatment was implemented over eight instructional meetings for both the experimental and control groups, with each meeting consisting of two lesson periods (2 × 45 minutes). Both groups studied the same Japanese language materials and followed the same instructional schedule to ensure comparable learning conditions. The experimental group received instruction through the Deep Learning approach integrated with the Project-Based Learning (PjBL) model, whereas the control group received conventional teacher-centered instruction. In the experimental group, the instructional process followed eight sequential stages: (1) goal orientation, (2) activation of prior knowledge, (3) exploration, (4) collaborative learning, (5) deep processing, (6) reflection, (7) project presentation, and (8) evaluation and feedback. These stages were implemented continuously throughout the eight instructional meetings. The detailed instructional procedures for both groups are presented in Section 3.1.3.

2.4 Data Analysis Method

The collected data were analyzed using SPSS version 32. Descriptive and inferential statistics were employed to determine the effectiveness of the Deep Learning approach.

2.4.1 Homogeneity Test

The homogeneity test was conducted to determine whether the variances of the two groups were equal. The homogeneity of variance was analyzed using Levene's Test. If the significance value was greater than 0.05, the data were considered homogeneous.

2.4.2 Normality Test

The normality test was conducted to determine whether the students pre-test score in the experimental and control groups were normally distributed. The Shapiro-Wilk test was employed using SPSS version 32, because the number of students in each group was 36, making it appropriate for assessing normality in the relatively small sample sizes of the two group. Data were considered normally distributed when the significance value was greater than 0.05.

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2.4.3 Hypothesis Test

Hypothesis testing in this study was conducted using parametric analysis with IBM SPSS Statistics version 32 for Windows. The Independent Sample t-test was used to determine whether there was a significant difference between the post-test scores of the experimental and control groups, while the Paired Sample t-test was employed to examine the differences between the pre-test and post-test scores within each group. The level of significance adopted in this study was $p < 0.05$.

3. Result and Discussion

3.1 Instructional Implementation

The implementation of the Deep Learning approach was conducted over eight instructional meetings, with each meeting consisting of two lesson periods (2 × 45 minutes), resulting in a total duration of 90 minutes per meeting. The experimental and control groups received the same Japanese language materials, learning objectives, instructional duration, and general assessment focus. However, the instructional processes differed in terms of learning activities, teacher and student roles, and instructional orientation. The experimental group received Deep Learning-based instruction integrated with the Project-Based Learning (PjBL) model, whereas the control group received conventional teacher centered instruction.

To ensure consistency between the proposed instructional framework and its actual implementation, the intervention in the experimental group was organized around eight instructional stages: (1) Goal Orientation, (2) Activation of Prior Knowledge, (3) Exploration, (4) Collaborative Learning, (5) Deep Processing, (6) Reflection, (7) Project Development and Presentation, and (8) Evaluation and Feedback. These stages were implemented progressively across the eight instructional meetings. Because exploration, collaboration, deep processing, and reflection were integral to the learning cycle, some stages were revisited during different meetings according to the learning needs and development of the project. Thus, the eight stages represent the complete instructional framework rather than eight separate one-time activities.

3.1.1 Learning Materials

The instructional materials were drawn from three topics in the Grade XI Japanese language curriculum:

a) *Koko wa Toshoshitsu desu* (ここはとしょしつです), which focused on introducing school facilities and identifying locations within the school environment.
b) *Nihongo wa Kayoubi desu* (にほんごはかようびです), which focused on school subjects, days of the week, and class schedules.
c) *Sensei wa Yasashii desu* (せんせいはやさしいです), which focused on describing people using Japanese adjectives and simple descriptive expressions.

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These topics were selected because they provided contextual opportunities for students to use simple Japanese expressions in situations related to their everyday school environment.

3.1.2 Implementation of Deep Learning-Based Instruction in the Experimental Group

The experimental group was taught using the Deep Learning approach integrated with Project-Based Learning (PjBL). The implementation emphasized the three principles of Deep Learning: mindful learning, meaningful learning, and joyful learning. Students were encouraged to become aware of their learning process, connect Japanese language materials with their experiences, collaborate with peers, solve contextual communication tasks, and reflect on their speaking performance. The teacher functioned primarily as a facilitator rather than as the sole source of information. The teacher provided contextual stimuli, guided inquiry, facilitated collaboration, monitored students' speaking activities, and provided formative feedback. Students were actively involved in exploring language resources, constructing utterances, practicing communication, developing projects, presenting their work, and reflecting on their learning. The eight stages of implementation are described below.

a) Stage 1. Goal Orientation

At the beginning of the instructional process, the teacher introduced the learning objectives and explained their relevance to authentic Japanese communication. The teacher presented contextual situations related to students' school life and explained the expected learning outcomes. Students identified what they were expected to learn and considered how the target Japanese expressions could be used in everyday communication.This stage emphasized mindful learning by helping students understand the purpose of learning and become aware of the knowledge and speaking skills they needed to develop.

b) Stage 2. Activation of Prior Knowledge

The teacher activated students' prior knowledge through brainstorming, guiding questions, short videos, visual materials, and brief classroom discussions. Previously learned vocabulary and sentence patterns were reviewed before students were introduced to new materials. Students recalled relevant Japanese expressions and connected their existing knowledge with the new learning topics. This stage supported mindful and meaningful learning because students were encouraged to recognize their existing knowledge and relate it to new Japanese language contexts.

c) Stage 3. Exploration

Students explored vocabulary, sentence patterns, and authentic Japanese expressions related to school facilities, school subjects, schedules, and descriptions of people. The teacher provided dialogues, visual materials, videos, and digital learning resources and guided students in identifying language patterns. Rather than immediately providing all answers, the teacher encouraged students to discover patterns and meanings through contextual examples. Students examined the materials, identified expressions, discussed their meanings, and practiced using

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the target language. This stage emphasized meaningful learning by connecting language forms with authentic communicative contexts.

d) Stage 4. Collaborative Learning

Students worked in small groups to discuss learning tasks, analyze dialogue structures, exchange ideas, and practice conversations. Depending on the learning topic, students participated in collaborative activities such as role playing, contextual dialogue practice, and preparation for project-based tasks.The teacher facilitated group activities, monitored student participation, provided clarification when necessary, and encouraged students to support one another. Students actively communicated with peers and practiced Japanese through collaborative tasks. This stage emphasized meaningful and joyful learning through peer interaction, collaboration, and active use of Japanese.

e) Stage 5. Deep Processing

Students completed contextual and inquiry-based tasks that required them to construct and modify Japanese expressions rather than merely reproduce memorized model dialogues. They were encouraged to adapt sentence patterns to authentic situations, solve communication problems, and create original utterances related to the assigned topics. For example, students applied Japanese expressions to describe locations within the school, discuss school schedules, and describe teachers or classmates. The teacher provided scaffolding and feedback while allowing students to make decisions about language use and task completion. This stage represented the deeper learning process by encouraging students to apply, analyze, and adapt their knowledge in meaningful communication. It therefore emphasized meaningful learning and higher-order thinking.

f) Stage 6. Reflection

Students reflected on their learning and speaking performance after completing learning tasks. They identified difficulties in pronunciation, vocabulary selection, sentence construction, fluency, or comprehension and discussed possible ways to improve their performance. The teacher facilitated reflection through guiding questions, peer feedback, and classroom discussion. Students evaluated their own performance and considered how they could improve their Japanese communication in subsequent activities. This stage emphasized mindful learning because students were encouraged to become aware of their strengths, difficulties, and learning progress.

g) Stage 7. Project Development and Presentation

The project component was developed as the culminating activity of the instructional process. Students worked collaboratively to prepare a project introducing aspects of the school environment using simple Japanese expressions. To accommodate differences in students' interests and strengths, students were allowed to select one of three product formats: a video vlog, a hand-drawn poster, or a digital poster. During the project development process, students selected relevant information, organized Japanese expressions, practiced their speaking, and

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prepared their presentation. The teacher acted as a facilitator by monitoring the development of each project, providing linguistic guidance, and giving formative feedback. The completed projects were presented through a Gallery Walk. Each group displayed or presented its project at a designated station while other groups rotated between stations. Presenters explained their projects using simple Japanese, while visiting students listened, asked questions, and provided feedback whenever possible. This stage emphasized meaningful and joyful learning because students used Japanese for an authentic communicative purpose, interacted with peers, and had opportunities to express their ideas through different forms of project output.

h) Stage 8. Evaluation and Feedback

The final stage involved evaluation and feedback on students' speaking performance. The teacher assessed students using the predetermined speaking assessment dimensions of pronunciation, grammar, vocabulary, fluency, and comprehension. Feedback was provided during the learning process and after the project presentation to help students recognize their strengths and areas requiring improvement. Students responded to feedback and evaluated their own learning progress. The formal post-test was administered after the completion of the eight instructional meetings to measure students' Japanese speaking performance following the intervention.

Table 1. Overview of the Eight Instructional Meetings in the Experimental Group

Meeting	Learning Topic	Main Instructional Stages	Learning Output
1	Orientation and *Koko wa Toshoshitsu desu*	Stages 1–2	Students identified learning objectives and activated prior knowledge about school facilities.
2	*Koko wa Toshoshitsu desu*	Stages 3–4	Students explored vocabulary and practiced collaborative dialogues about school facilities.
3	*Nihongo wa Kayoubi desu*	Stages 3–5	Students explored expressions for school subjects and schedules and created contextual conversations.
4	*Nihongo wa Kayoubi desu*	Stage 6	Students reflected on their speaking performance and improved their conversations based on peer and teacher feedback.
5	*Sensei wa Yasashii desu*	Stages 3–5	Students described teachers and classmates using Japanese adjectives in authentic communication tasks.
6	*Sensei wa Yasashii desu*	Stage 6	Students reflected on their speaking performance and refined their language use through collaborative activities.
7	Project Development	Stage 7	Students developed their selected projects (video vlog, hand-drawn poster, or digital poster) in preparation for presentation.
8	Gallery Walk, Project Presentation, and Evaluation	Stages 7–8	Students presented their projects through a Gallery Walk, responded to questions from peers, received formative feedback, and completed the final evaluation.

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As shown in Table 1, the eight stages were implemented progressively rather than as eight isolated activities. Stages 3–6 were revisited across different learning topics to provide students with repeated opportunities to explore language, collaborate, process language deeply, and reflect on their speaking performance.

Table 2. Detailed Implementation of the Eight-Stage Instructional Framework

Stage	Main Activities	Teacher's Role	Students' Role	Deep Learning Integration
1. Goal Orientation	Introduce objectives and authentic communication context.	Explain objectives and context.	Identify learning goals and communicative purposes.	Mindful: awareness of goals; Meaningful: relevance to communication.
2. Prior Knowledge Activation	Brainstorming, questioning, review, and short videos.	Activate prior knowledge.	Recall and connect previous knowledge with new material.	Mindful: awareness of prior knowledge; Meaningful: connection to new context; Joyful: interactive activities.
3. Exploration	Explore vocabulary, patterns, and expressions through dialogues, visuals, and digital media.	Facilitate exploration and provide resources.	Identify, interpret, and practice expressions.	Mindful: language awareness; Meaningful: authentic context; Joyful: interactive media.
4. Collaborative Learning	Group discussion, dialogue analysis, and speaking practice.	Facilitate and monitor collaboration.	Discuss, practice, and support peers.	Mindful: learning awareness; Meaningful: peer communication; Joyful: collaboration.
5. Deep Processing	Inquiry-based tasks and construction of original conversations.	Provide scaffolding and feedback.	Analyze, solve communication problems, and construct expressions.	Mindful: language monitoring; Meaningful: contextual application; Joyful: creative tasks.
6. Reflection	Self- and peer-reflection on speaking performance.	Guide reflection and provide feedback.	Evaluate pronunciation, grammar, vocabulary, fluency, and comprehension.	Mindful: self-awareness; Meaningful: improvement and application.
7. Project Development & Presentation	Develop and present video vlogs, hand-drawn posters, or digital posters through Gallery Walk.	Facilitate projects and presentations.	Collaborate, present, ask/answer questions, and give peer feedback.	Mindful: language monitoring; Meaningful: real school context; Joyful: creative project and Gallery Walk.
8. Evaluation & Feedback	Speaking evaluation and constructive feedback.	Assess speaking performance and provide feedback.	Demonstrate speaking ability and respond to feedback.	Mindful: performance awareness; Meaningful: communication relevance.

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3.1.3 Learning Activities in the Control Class

The control class received instruction through a conventional teacher-centered approach over eight instructional meetings. Each meeting followed a similar sequence of activities consisting of teacher explanation, guided practice, and individual exercises. At the beginning of each lesson, the teacher introduced the learning objectives and explained new vocabulary, grammar, and sentence patterns related to the lesson topic. Students listened to the explanation, took notes, and completed vocabulary memorization activities.

After the explanation, students practiced model dialogues provided in the textbook through repetition and pronunciation drills under the teacher's guidance. Question and answer sessions were conducted to reinforce students' understanding of vocabulary and grammatical structures. In the practice session, students completed individual written exercises and performed short role-play activities based on textbook examples. The teacher corrected pronunciation and grammatical errors while providing additional explanations when necessary.

At the end of each meeting, the teacher summarized the lesson, reviewed key vocabulary and sentence patterns, assigned homework when appropriate, and provided brief feedback on students' performance. Compared with the experimental class, opportunities for collaborative learning, inquiry, reflection, and project-based activities were limited, resulting in a predominantly teacher-centered learning environment.

Table 3. Sequence of Conventional Instruction Implementation Across Eight Instructional Meetings in the Control Group

Meeting	Learning Topic	Main Instructional Activities	Learning Output
1	*Koko wa Toshoshitsu desu*	Teacher explained vocabulary and expressions related to school facilities and locations.	Students identified school facility vocabulary and location expressions.
2	*Koko wa Toshoshitsu desu*	Students practiced model dialogues through repetition, pronunciation drills, and guided practice.	Students practiced introducing school facilities.
3	*Nihongo wa Kayoubi desu*	Teacher explained vocabulary about school subjects, days, and schedules.	Students used simple expressions related to school schedules.
4	*Nihongo wa Kayoubi desu*	Students practiced textbook dialogues and structured role-play activities.	Students practiced expressing class schedules in Japanese.
5	*Sensei wa Yasashii desu*	Teacher explained adjectives and expressions for describing people.	Students described people using simple Japanese adjectives.
6	*Sensei wa Yasashii desu*	Students practiced descriptive dialogues through guided exercises.	Students improved pronunciation and sentence accuracy.
7	Speaking Practice and Review	Teacher reviewed materials and provided additional speaking exercises.	Students reinforced vocabulary and speaking skills.
8	Evaluation	Teacher reviewed materials and conducted final speaking practice.	Students prepared for the evaluation

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3.1.4 Learning Activities in the Experimental Class

The experimental class implemented the Deep Learning approach through the Project-Based Learning (PjBL) model across eight instructional meetings. The learning process followed the eight instructional stages described in Section 3.1.3 and emphasized meaningful learning through inquiry, collaboration, reflection, authentic communication, and project development. Throughout the instructional process, the teacher functioned primarily as a facilitator, guiding students to explore learning resources, solve contextual communication tasks, collaborate with peers, and reflect on their learning experiences. Students actively constructed knowledge by using Japanese in meaningful situations rather than relying solely on memorization of vocabulary and sentence patterns. The implementation encouraged students to communicate more frequently, develop confidence in speaking Japanese, and gradually improve their communicative competence through continuous practice and formative feedback.

3.1.5 Final Project

The final project required students to introduce the school environment using simple Japanese expressions. To accommodate students diverse learning preferences, differentiated instruction was implemented by allowing students to choose one of the following project products: a video vlog, a hand drawn poster, or a digital poster. Although the products differed in format, all students were assessed based on their Japanese speaking performance rather than the visual or technical quality of the products.

The same speaking assessment criteria were applied to all students, covering pronunciation, grammar, vocabulary, fluency, and comprehension. For the video vlog, students demonstrated their speaking ability through an oral presentation recorded in the video. For the hand drawn and digital poster projects, students presented and explained their products orally to their classmates. Thus, the differentiated products served as different media for demonstrating the same target speaking proficiency. Students were free to select the product that best reflected their interests and strengths while demonstrating their Japanese speaking ability.

3.1.6 Learning Strategies and Digital Media

Several instructional strategies were integrated into the eight-stage framework, including inquiry-based learning, collaborative learning, role-play, and Gallery Walk. Inquiry-based activities encouraged students to explore vocabulary and sentence patterns through contextual questions and tasks. Collaborative learning provided opportunities for students to exchange ideas, practice conversations, and support one another during speaking activities. Role-play enabled students to apply Japanese expressions in simulated authentic situations, such as introducing school facilities and describing people. Gallery Walk provided opportunities for project presentation, peer interaction, questioning, and feedback.

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Digital media were also integrated to reinforce the three principles of Deep Learning and to support formative assessment. Wordwall provided interactive activities for practicing vocabulary, grammar, and sentence patterns, allowing students to actively engage with the learning materials in an enjoyable manner. ZEP Quiz was used to assess students understanding through game-based formative activities, providing immediate opportunities for students to recognize their understanding and learning progress. Thus, the instructional strategies and digital media were not implemented as separate techniques but were deliberately integrated into the learning activities to support mindful engagement, meaningful language use, and joyful participation throughout the Deep Learning process.

3.2 Research Findings

This study employed a quantitative approach using a true experimental design, specifically the Pretest–Posttest Control Group Design. The study aimed to examine the effectiveness of the Deep Learning approach in improving Japanese speaking skills among eleventh-grade students at SMAN 1 Sumedang. The population of this study consisted of 432 eleventh-grade students at SMAN 1 Sumedang. The sample comprised 72 students, who were divided into two groups: 36 students in the control group and 36 students in the experimental group. Data collection was conducted by administering a pretest to both groups. Subsequently, the experimental group received treatment through the implementation of the Deep Learning approach over eight instructional sessions. Finally, a posttest was administered to both the experimental and control groups to evaluate the effectiveness of the treatment.

3.2.1 Pre-Test Results

Based on Table 4, it can be observed that all students in both the control and experimental classes were classified in category D, with scores below 70. No students achieved category A, B, or C. These findings indicate that the students' initial Japanese speaking ability was relatively low and had not yet reached the Minimum Mastery Criterion (KKTP) of 75. The results suggest that students experienced difficulties in several aspects of Japanese speaking skills, including pronunciation, vocabulary use, grammatical accuracy, fluency, and comprehension. The low pre-test scores indicate that the majority of students had limited speaking proficiency before the implementation of the Deep Learning approach.

Table 4. Pre-Test Score Distribution

No.	Score Range	Category	Control Class	Experimental Class
1	93–100	A	0	0
2	84–92	B	0	0
3	75–83	C	0	0
4	< 75	D	36	36

Source: Research Data Processed by the Author (2026)

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During the pre-test session, many students appeared hesitant and lacked confidence when performing the speaking tasks. Several students produced short responses, paused frequently, and demonstrated limited vocabulary and sentence structures. These findings indicate that both groups possessed relatively low initial abilities before the treatment. Moreover, the similar distribution of scores between the control and experimental classes suggests that both groups had comparable levels of Japanese speaking proficiency at the beginning of the study. Therefore, the effectiveness of the Deep Learning approach could be evaluated objectively through the comparison of post-test results between the two groups.

3.2.2 Homogeneity Test

After conducting the pre-test, a homogeneity test was performed using Levene's Test through SPSS version 32 to determine whether the variances of the two groups were equal. Based on Table 5, the significance value obtained from the Based on Mean statistic was 0.557, which is greater than the significance level of 0.05. Therefore, the null hypothesis of equal variances is accepted, indicating that the pre-test scores of the control and experimental groups were homogeneous. This result demonstrates that both groups had relatively similar variance distributions before the implementation of the Deep Learning approach. Since the significance value exceeded 0.05, the assumption of homogeneity was fulfilled.

3.2.3 Normality Test

After conducting the homogeneity test, a normality test was performed to determine whether the pre-test scores were normally distributed. The Shapiro Wilk test was employed because the sample size in each group was fewer than 50 students. The criterion for normality was a significance value greater than 0.05. As shown in Table 6, the significance value for the control class was 0.408, while the experimental class obtained a significance value of 0.221. Since both significance values are greater than 0.05, it can be concluded that the pre-test scores in both groups were normally distributed.

Table 5. Homogeneity Test Results

		Levene Statistic	**df1**	**df2**	**Sig.[a]**
Speaking Test Result	Based on Mean	.348	1	70	.557
	Based on Median	.182	1	70	.671
	Based on Median and with adjust df	.182	1	68.562	.671
	Based on trimmed mean	.305	1	70	.582

Source: SPSS Data Processing Results (2026)

Table 6. Normality Test Results

	Kolmogorov-Smirnov [a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Japanese Control Class	.142	36	.065	.969	36	.408
Japanese Experimental Class	.150	36	.040	.960	36	.221

Source: SPSS Data Processing Results (2026).

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3.2.4 Post-Test Results

After the implementation of the Deep Learning approach for eight instructional meetings, a post-test was administered to evaluate students' Japanese speaking skills. The post-test aimed to measure the effectiveness of the Deep Learning approach in improving students' speaking performance.

Based on Table 7, it can be observed that students who achieved the Minimum Learning Achievement Criteria (KKTP) of 75 reached 33 students in the experimental class and 21 students in the control class**.** Furthermore, students who achieved the excellent category (A) in the experimental class totaled 4 students, whereas only one student in the control class reached the same category. In addition, most students in the experimental class were classified in categories B and C, indicating a considerable improvement in speaking performance after the implementation of the Deep Learning approach.

During the post-test, students in the experimental class appeared more confident and actively participated in the speaking tasks. They were able to express their ideas more fluently and demonstrated better pronunciation, vocabulary use, and grammatical accuracy. In contrast, several students in the control class still showed hesitation and experienced difficulties in completing the speaking tasks.

The students responses in the experimental class also indicated improvements in both the quantity and quality of oral production. Many students were able to produce longer utterances, use more appropriate vocabulary, and communicate their ideas more effectively. Meanwhile, some students in the control class still demonstrated limited speaking ability and occasionally produced incomplete responses.

These findings indicate that the implementation of the Deep Learning approach contributed positively to the improvement of students' Japanese speaking skills. The experimental group showed substantially better performance than the control group, suggesting that Deep Learning was effective in enhancing speaking proficiency among senior high school students.

Table 7. Post-Test Score Distribution

No.	Score Range	Category	Control Class	Experimental Class
1	93–100	A	1	4
2	84–92	B	5	17
3	75–83	C	15	12
4	< 75	D	15	3

Source: Research Data Processed by the Author (2026)

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3.2.5 Hypothesis Testing

The post-test scores obtained from both the experimental and control groups were analyzed using the Independent Sample t-test to determine whether there was a significant difference in speaking achievement between the two groups after the treatment. The analysis was performed using SPSS version 23 with a significance level of 0.05. The results of the Independent Sample t-test showed that the Sig. (2-tailed) value was < 0.001, which was lower than the significance level of 0.05. Therefore, the null hypothesis (H_0) was rejected and the alternative hypothesis (Ha) was accepted. This finding indicates that there was a statistically significant difference between the post-test scores of the experimental and control groups. These findings demonstrate that the Deep Learning approach was effective in improving students' Japanese speaking skills. Students in the experimental class achieved significantly higher speaking performance than those in the control class. Improvements were observed in several aspects of speaking ability, including pronunciation, vocabulary usage, grammatical accuracy, fluency, and comprehension.

During the speaking activities, students in the experimental class appeared more confident and actively participated in classroom interactions. Learning activities emphasizing meaningful learning, collaboration, reflection, and authentic communication contexts encouraged students to use Japanese more actively and effectively. In Japanese language learning, speaking requires learners to integrate vocabulary, grammar, pronunciation, and communicative competence simultaneously. The Deep Learning approach enables students not only to memorize linguistic forms but also to apply them in meaningful communication situations. Through collaborative activities, contextual tasks, and reflective learning processes, students were able to use Japanese expressions more appropriately and confidently in real-life communication contexts. In contrast, several students in the control class still experienced difficulties in expressing their ideas and tended to rely on limited vocabulary and simple sentence structures. Therefore, it can be concluded that the Deep Learning approach significantly improves Japanese speaking skills among eleventh-grade students at SMAN 1 Sumedang.

Table 8. Independent Sample t-Test Results

		t-test for Equality of Means							
				Significance				95%Confidence Interval of The Difference	
		T	Df	One-Sided p	Two-Sided p	Mean Difference	Std. Error Difference	Lower	Upper
Japanese Speaking Test Result	Equal variances assumed	-5.162	70	<,001	<,001	-12.444	2.411	-17.253	-7.636
	Equal variances not assumed	-5.162	53.299	<,001	<,001	-12.444	2.411	-17.253	-7.636

Source: Processed SPSS Data (2026)

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4. Conclusions

Based on the results, discussion, and data presented in this study, it can be concluded that the implementation of the Deep Learning approach was effective in improving the Japanese speaking skills of eleventh grade students at SMAN 1 Sumedang. This finding was evidenced by the higher post-test scores achieved by the experimental class compared to the control class after receiving the treatment using the Deep Learning approach. Furthermore, the results of the Independent Sample t-test revealed that the Sig. (2-tailed) value was < 0.001, indicating that the alternative hypothesis (Ha) was accepted. Therefore, it can be concluded that the implementation of the Deep Learning approach was proven to be effective in enhancing students' Japanese speaking skills. Consequently, the Deep Learning approach can be considered an effective instructional approach for improving Japanese speaking skills among senior high school students.

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Author Contributions

A.A.: conceptualization, methodology, investigation, data curation, formal analysis, writing – original draft, and writing – review and editing. H.H.: supervision, writing – review and editing. J.J.: supervision, writing – review and editing.

Conflict of Interest Statement

The authors declare no conflict of interest.

Generative AI Usage Declaration

ChatGPT (OpenAI) was used to assist in improving the language and readability of the manuscript, specifically in the Introduction and Discussion sections. Its use was limited to language editing and improvement of readability. The author takes full responsibility for the accuracy, interpretation, and integrity of the manuscript.

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