



# Mapping Meaning in Kanji: A Quasi-Experimental Study on Learning Gains Among Indonesian Learners of Japanese

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## Abstract

*Japanese language learners whose native writing systems do not include kanji often encounter difficulties in using kanji effectively in complex discourse, remembering onyomi and kunyomi readings, and understanding their meanings. This study explores the effectiveness of kanji mapping as a strategy to enhance kanji comprehension and memorization among second-year students in the Japanese language Education Program at Universitas Pendidikan Indonesia (UPI). The research focuses on the Chukyu Hyouki course, which covers 220 N3 level kanji from the Kanji Master N3 textbook. Using a quasi-experimental one-group pre-test and post-test design, the study was conducted over three sessions involving 23 fourth-semester students. Data were collected through pre-tests, post-tests, and questionnaires. The findings indicate a significant improvement in kanji mastery, with average test scores increasing from 66.6 to 88.1. Questionnaire responses further suggest that students found kanji mapping helpful in organizing and internalizing onyomi, kunyomi, and bushu (radicals). This structured visual approach supported accurate contextual application and contributed to long-term retention. Overall, the results support the integration of kanji mapping into kanji instruction to improve learner outcomes.*

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## INTRODUCTION

For non-Kanji learners, such as Japanese learners in Indonesia, kanji presents a significant challenge due to its complexity (Sudjianto & Dahidi, 2007; Lensun, 2016; Visiaty & Yulianti, 2013; Nakamura 2019). According to Kano (2001; 2017), foreign learners of Japanese who come from alphabet-based language backgrounds struggle with the vast number of Kanji characters, their intricate shapes, multiple readings (onyomi and kunyomi), and the fact that a single Kanji character can convey multiple meanings. Consequently, achieving proficiency in Kanji requires considerable time and effort. On the other hand, learning Kanji is considered fundamental for Japanese language learners, as it forms the "backbone" of vocabulary acquisition (Sudjianto & Dahidi, 2007). The key to mastering Kanji lies in frequent practice of its shape, readings, and meanings (Rodsuk, 2018), despite the substantial time and effort required (Fukumura, 2022).

The Japanese government issued *Jouyou kanji* in 1981, comprising 1,945 commonly used characters. *Jouyou Kanji* serves as a reference for everyday written communication in Japan (Suzuki and Ishida, 1999). More recently, the number of Kanji characters actively used in writing has expanded to 2,136 (Oomori and Suzuki, 2013). Therefore, Japanese language learners are encouraged to acquire and memorize between 1,000-2,000 Kanji characters as a foundational goal (Wiwatanapataphee, 2017).

A study by Ulambayar (2005) on Japanese-language learners at the Mongolian University of Science and Technology identified key difficulties faced by non-Kanji users: (1) multiple readings of a single Kanji, (2) a high number of strokes, (3) stroke order, (4) visual similar Kanji, (5) difficulty in retention due to infrequent use, and (6) a lack of effective memorization strategies. Since a single Kanji character can have multiple pronunciations, and a single pronunciation can correspond to different Kanji, learning these readings presents an additional challenge. According to Suzuki and Ishida (1999), Kanji

readings are categorized into *onyomi* (borrowed readings) and *kunyomi* (native Japanese readings), with *onyomi* generally written in Katakana and *kunyomi* in Hiragana.

At the faculty of Language and Literature Education, Universitas Pendidikan Indonesia, Kanji courses are incorporated into the curriculum from the first to the seventh semester. Students are expected to learn and master between 1,000 and 1,400 Kanji characters to develop proficiency in reading, writing, and comprehension. Achieving this level of competence enables students to engage with complex texts, compose essays, and apply Kanji effectively in various discourse contexts.

However, many students struggle with memorization, particularly in distinguishing onyomi and kunyomi, using Kanji appropriately in context, and recalling stroke order. These challenges are exacerbated by teacher-centered learning methods and the lack of instructional materials explicitly addressing *kakijun* (kanji stroke order). Consequently, students face difficulties in reading advanced texts, as they are unable to recognize or understand the Kanji used (Herniwati & Aneros, 2014).

To address these issues, educators must explore innovative teaching methods to enhance Kanji mastery. According to Sudjianto (2010), effective learning techniques play a crucial role in achieving instructional goals.

Several studies have investigated effective Kanji teaching and learning methods. Limjaroen (2016) explored the effectiveness of mind mapping in Kanji learning among students at Suansunandha Rajabhat University, Thailand. The findings indicated that students had a positive attitude toward mind mapping, as it enhanced their knowledge, engagement, and behavioral responses to Kanji learning.

Seki (2017; 2018) introduced the concept of a "Kanji map", which helps learners visualize relationships between Kanji characters, facilitating deeper comprehension. Similarly, Wiwatanapataphee (2017) adapted mind mapping techniques by incorporating *bushu* (radicals), linking related Kanji and vocabulary to

reinforce learning. The study demonstrated that Kanji mapping aids in understanding basic Kanji and vocabulary in a more imaginative way.

However, learners with limited prior knowledge struggle to connect Kanji characters effectively, resulting in fewer vocabulary associations than expected. Fukumura (2022) explored an alternative traditional Kanji instruction by allowing learners to select themes, compile related vocabulary, and create Kanji maps. This approach emphasized long-term retention and provided valuable insights into the effectiveness of Kanji mapping as a learning strategy.

While these studies acknowledge the challenges posed by limited Kanji knowledge, further research is needed to explore how different levels of prior knowledge impact the effectiveness of these methods. Future studies should investigate whether mind mapping and Kanji mapping strategies yield different outcomes depending on learners' initial Kanji proficiency.

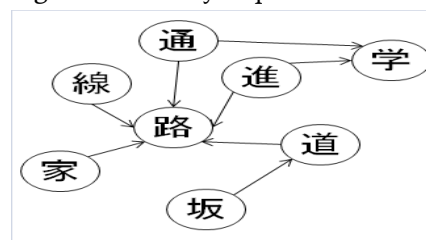
Additionally, research should investigate whether these techniques enhance long-term vocabulary retention and active usage beyond basic recognition. Comparative analyses between traditional mind mapping and Kanji-specific mapping techniques are also needed to determine which elements are most effective for different learner demographics and proficiency levels.

Given these considerations, Kanji mapping presents a promising learning method for improving Kanji memorization, reading, and writing skills. It is expected to help students retain Kanji characters more effectively by structuring vocabulary relationships on a single sheet of paper. The use of Kanji connection maps can encourage learners to engage their imagination while acquiring new vocabulary.

This study aims to move beyond basic vocabulary comprehension by focusing on long-term retention and the active application of vocabulary learned through Kanji mapping. To achieve this, a comparative analysis will be conducted to identify the specific elements of Kanji mapping that contribute to its effectiveness

in contrast to traditional mind mapping techniques.

Furthermore, this study will develop and evaluate a Kanji mapping prototype (as depicted in Figure 1) and assess its effectiveness in a controlled learning environment. In particular, it will explore how imaginative associations within Kanji mapping can foster deeper and more meaningful vocabulary acquisition.



**Figure 1**  
**Kanji Mapping**

## METHOD

This study employed a quantitative approach for data collection and analysis. Data were gathered through tests and questionnaires. The tests, including pretests, posttests, and quizzes, were analyzed to measure the extent to which participants' kanji learning abilities improved throughout the study.

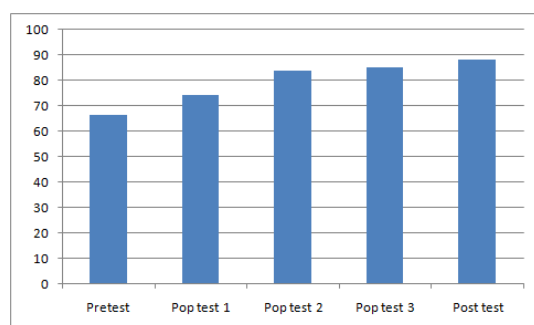
**Tabel 1**

**List of kanji at every treatment**

Treatment	Kanji
1 <sup>st</sup>	熱・冷・温・度・材・型・焼・器・卵・乳・粉・塩・菜・果・豆・缶・杯・枚・匹・量
2 <sup>nd</sup>	頭・顔・首・鼻・呼・吸・息・汗・検・査・歯・痛・血・液・包・帯・救・助・死・亡
3 <sup>rd</sup>	授・業・級・卒・欠・席・由・訳・例・易・解・説・覚・忘・努・続・要・復・補・効

The implementation followed a modified version of Seki's (2019) kanji mapping method, consisting of the following steps: 1) explaining kanji forms, readings, writing, and memorization techniques; 2) brainstorming; 3) categorizing; 4) completing practice exercises, and 5) creating kanji mapping (see figure 1) based on the kanji





**Figure 3**  
**Mean of mastering *kanji* with Kanji Mapping**

#### Student responses to the application of kanji mapping in learning kanji

The results of the questionnaire obtained from Google Form are displayed in the form of a table grouped based on the benefits and constraints in creating and using kanji mapping in kanji learning.

**Tabel 4**  
**Analysis of respondents' answers to the question, "What are the benefits of making and using kanji mapping?"**

Theme	Code	f	Sample Expressions
Cognitive	Ensures permanent learning.	20	"Kanji mapping allows me to understand combined kanji material (kanji jukugo) quickly"
	Ensures meaningful and efficient learning.	18	"Utilizing colors in kanji mapping significantly boosts memory retention"
	Facilitates remembrance.	23	"This technique makes it much easier to master kanji learning materials"
	Ensures considering the subject as a whole.	18	"By adopting kanji mapping-based resources, I can greatly enhance my comprehension"

			and proficiency in learning kanji"
	Ensures multi-dimensional thinking.	17	
	Ensures envision of what was learned.	22	
Affective	It is a funny activity.	22	"Kanji mapping makes it easier and more enjoyable for me to learn kanji"
	Increases interest, attention and motivation.	23	"I find the process of creating kanji maps engaging and fun, which keeps my attention. Overall, I consider kanji mapping to be an enjoyable activity"
Individual features	It is a practical form of presentation which is prepared in a short time.	19	"Kanji mapping enhances my creativity"
			"Kanji Mapping has a significantly positive impact on my creative process"
			"Kanji Mapping supports my visual intelligence.
	It improves creativity and imagination.	25	
	Improves our visual perception	22	

Based on Table 4, it is evident that the respondents' answers can be categorized into three themes: cognitive, affective, and individual. In the cognitive theme, respondents highlighted several benefits of creating and using kanji mapping. These benefits include facilitating continuous learning, enhancing memory

retention, making kanji learning more meaningful and efficient, and promoting a comprehensive approach to kanji study that encompasses *bushu* (radicals), reading methods (*yomikata*), and combined *kanji-jukugo* (kanji words). Additionally, they emphasized the importance of multidimensional thinking by connecting various kanji characters, as well as fostering a clear vision for understanding the kanji that have been learned.

Respondents highlighted the powerful impact of the "affective" aspect, emphasizing that incorporating mind maps significantly boosts interest, attention, and motivation. In the context of the "individual" theme, they pointed out that creating and using kanji maps not only enhances creativity, imagination, and visual perception but also provides an effective and engaging way to demonstrate their understanding of kanji. This method allows for practical presentation that can be completed in a short timeframe, making it both efficient and enriching. Based on the questionnaire results, more than half of the respondents agreed that the kanji learning process using kanji mapping is interesting and fun and can create an active learning atmosphere. Moreover, using kanji mapping can make it easier to understand, memorize, and answer kanji practice questions and solve learning difficulties.

**Tabel 5**  
**The Analysis of the Answers Which Respondents Gave to the Question of "What are the constraints of using kanji mapping?"**

Theme	Code	f	Sample Expressions
Individual	Being hard for the brain.	5	"I have difficulty connecting one kanji to another." "I struggle with determining the placement
	Since it is personal, being hard for others to understand.	10	

	Forget the meaning or significance or how to read kanji that is associated with several other kanji	7	of kanji, vocabulary, and meanings when trying to fit everything on one page." "Positioning the kanji correctly can be challenging because each one can form various words". "Sometimes, the complexity of kanji mapping makes the vocabulary difficult to understand." "I have trouble finding vocabulary that isn't in the material book, and I often have difficulty locating colored pencils."
Material	Not having a good skill of drawing	5	
	The difficulty of finding the symbols related to the subject	8	

According to Table 5, the responses from participants are categorized into individual and material themes. Within the "individual" theme, respondents identified several obstacles to using kanji mapping, including: the difficulty for the brain to process information, the challenge for others to understand the mappings because they can be personal, the tendency to forget the meanings associated with certain kanji, inadequate drawing skills, and difficulties in finding symbols relevant to the subject matter. In the "material" theme, they noted issues such as not always having access to colored pens and not consistently being able to locate the desired visuals.

### Discussion

The findings of this study indicate that the implementation of kanji mapping has notably enhanced the understanding and mastery of kanji among learners of the Japanese language. As shown in Table 3, the participants' average pretest score was 66,6, serving as a baseline for assessing the development of their kanji proficiency. Following the application of the



kanji mapping technique, participants consistently achieved higher scores, indicating the method's effectiveness in facilitating Kanji acquisition.

The improvement of 21.5 points from pretest to posttest highlights the substantial impact of the intervention. Notably, the most significant increase occurred after the first treatment, with an average gain of 12.9 points. This suggests that learners responded particularly well to the initial introduction of kanji mapping, which likely helped them grasp the connections between kanji characters and their meanings more effectively.

However, further analysis indicated that the rate of score improvement began to taper off after the first treatment session. Specifically, there was an increase of 5.3 points during the second treatment and only 0.9 points in the third treatment, suggesting that while respondents continued to show progress, the pace of improvement approached a saturation point. This trend may be attributed to several factors, including the need for students to internalize the information they have acquired and potential fatigue resulting from the repetitive application of the same method.

It is essential to emphasize that despite the decrease in the rate of improvement, the final post-test score reached 88.1, indicating that respondents achieved a higher level of kanji mastery. This observation is consistent with previous research indicating that semantic mapping techniques can effectively assist students in organizing and retaining new information (Corrêa & Ludermir, 2008; Hartati, S., & Basuni, A., 2024).

The implications of these findings suggest that while kanji mapping is an effective instructional method, it is important to consider variations in teaching strategies to maintain learners' motivation and engagement in the study of the Japanese language. Future research may explore different combinations of instructional methods to enhance the effectiveness of kanji learning and investigate factors influencing the rate of improvement among learners in their pursuit of kanji mastery.

Using kanji mapping as a learning strategy can enhance students' kanji proficiency, particularly for intermediate and advanced learners. This finding aligns with previous studies, which indicate that kanji mapping techniques effectively address challenges in kanji acquisition and support students in learning at higher proficiency levels (Masters and Mori; 1993).

Furthermore, Student's engagement in their learning process increased, as evidenced by key behaviors such as actively responding to classroom exercises, demonstrating attentiveness, asking and explaining concepts to peers and lecturers, memorizing kanji cards, creating kanji maps, completing exercises diligently, and submitting assignments on time. These findings suggest that kanji mapping is an engaging and effective instructional technique for teaching kanji (Sudjianto; 2010).

Learning becomes easier and more fun for students with difficulty remembering kanji. The problems that cause the low level of mastering kanji are identified, such as the numerous kanji, the mistakes in reading and comprehending the combined kanji, how to write the sequence of writing kanji by the existing hitsujun because of the innumerable *kaki kata*, the number of graffiti, *bushu*, *kakusuu*. The problems are solved by applying kanji mapping in the kanji learning process. Each treatment consists of three times of tests and reflection. The materials provided are designed for the middle to advanced level. On the other hand, some findings of this study are also different from other studies, as they indicated that kanji mapping can improve writing competency (Iijima, 2015) and memorizing vocabulary (Thuy, 2003).

The results of the questionnaire reveal that the use of kanji mapping in learning kanji provides significant advantages, which can be categorized into three main themes: cognitive, affective, and individual.

#### 1. Cognitive Theme

From a cognitive prespective, respondents reported that kanji mapping facilitated an engaging and meaningful learning experience (Luangkrajang, 2022). They noted improvements in memory retention and a deeper comprehension of essential elements such as bushu (radicals), reading methods (yomikata), and kanji-jukugo (kanji compounds). These findings suggest that kanji mapping functions not only as an effective visual aid, but also as a method that encourages multidimensional thinking (Chu, Nakazawa, and Kurohashi, 2012). By connecting various kanji characters, students can develop a more comprehensive and nuanced understanding of the Japanese language.

## 2. Affective Theme

The affective aspect of kanji mapping is highly significant, as many respondents report finding the process both enjoyable and engaging (Yao & Jin, 2024). This sense of enjoyment greatly enhances their interest, attention, and motivation for learning. When students actively participate in a fun and interactive learning experience, they tend to be more responsive, leading to improved academic outcomes (Anwer, 2019). This clearly underscores the importance of fostering a supportive and enjoyable educational environment.

## 3. Individual Theme

From an individual perspective, kanji mapping has been shown to effectively enhance students' creativity (Jin et al., 2024) and visual perception. Respondents indicated that this innovative approach allows them to convey their understanding in an engaging and practical manner. However, despite the numerous benefits, students also face certain challenges when utilizing kanji mapping.

### **Obstacles in Using Kanji Mapping**

As shown in Table 5, the challenges related to kanji mapping can be divided into two main themes: individual difficulties and material constraints. In terms of individual challenges,

respondents reported difficulties in connecting kanji characters in a logical way and in making their maps easily understandable to others. These issues suggest that although kanji mapping is helpful for individual learning, it may not always support effective collaboration and discussion within study groups-an important component of an enriching educational experience.

Material-related challenges were also highlighted such as lack of drawing skills and limited access to resources like colored pencils. These obstacles may hinder students from fully engaging in kanji mapping activities. This finding points to the need for better institutional support in terms of both materials and training, so that learners can fully benefit from this method.

Overall, the findings provide compelling evidence that kanji mapping is an effective pedagogical tool for teaching Japanese kanji. By employing this method, students can overcome many of the challenges typically associated with kanji learning. Therefore, the integration of kanji mapping into the Japanese language curriculum is strongly recommended, as it has the potential to significantly enhance students' learning outcomes.

## **CONCLUSION**

The implementation of kanji mapping in kanji learning has been shown to significantly enhance the kanji mastery of sixth-semester students in the Department of Japanese Language Education at FPBS, Universitas Pendidikan Indonesia. This improvement is evident in students' ability to read, write, memorize, and comprehend the meanings of compound kanji. Moreover, learning activities that incorporate kanji mapping allow students to engage in self-evaluation, particularly when creating kanji maps for compound kanji, reading onyomi and kunyomi, and practicing kanji writing.

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