CHI'E Vol. 12 (1) (2024)

Chi'e: Jurnal Pendidikan Bahasa Jepang

Terindeks Sinta 3

http://journal.unnes.ac.id/sju/index.php/chie

Hitokoma Kanji App as a Direct Corrective Feedback Medium

Noviyanti Aneros[1*], Arvina Tri Esthi Mega Putri[2], Renariah[3], Juju Juangsih[4]

Japanese Language Education, Faculty of Language and Literature Education, Universitas Pendidikan Indonesia, Indonesia
email: aneros.noviyanti@upi.edu[1]

*Corresponding Author

Article Info

Article History:
Received December 2023
Approved February 2024
Approved March 2024

Keywords:
direct corrective feedback; kanji writing; practise; self-learning.

Abstract

In the current era, technology is utilized for various activities, including learning. Learning applications are one such example, and they can be used as a medium for self-learning and corrective feedback. This study utilized an application called Hitokoma Kanji for kanji writing practice. The research sample consisted of 14 participants from second-year students of the Department of Japanese Language Education at FPBS UPI. This study aims to find out the process of kanji writing practice and corrective feedback using the Hitokoma Kanji application for four meetings. The method used in this research is qualitative. This research is explorative or preliminary, so the data taken is based on observation activities through screen recordings to understand how the Hitokoma Kanji application can affect kanji learning rather than conducting tests. The result of this study is the use of the Hitokoma Kanji application as a kanji writing practice media, and the Extrusion/Lenght Check feature helps participants to remember the order of scribbles and the shape of scribbles on kanji by the writing rules.

✉ Alamat korespondensi:
Gedung B4 Lantai 2 FBS Unnes
Kampus Sekaran, Gunungpati, Semarang, 50229
E-mail: chie@unnes.ac.id

E-ISSN 2685-6662
P-ISSN 2252-6250

INTRODUCTION

In the 21st century, technological advancements have rapidly revolutionized various aspects of life, including the economy, industry, education, social and cultural spheres (Amalia, 2022). This phenomenon is commonly called the Fourth Industrial Revolution or Society 4.0. According to the kominfo.go.id page, Indonesia is currently in the era of the Industrial Revolution 4.0 (society 4.0), more precisely after the launch of the Roadmap (road map) named "Making Indonesia 4.0" by President Joko Widodo on April 4, 2018. Saxena et al. (2020, p. 359) describe the Fourth Industrial Revolution (Industry 4.0 or Society 4.0) as the hyper-connectivity revolution. This revolution provides a real-time interface between the virtual and physical worlds through the Cyber-Physical System, as well as other technologies such as the Internet of Things (IoT), the Internet of Everything (IoE), Big Data, and Artificial Intelligence (AI).

In education, the influence of the Fourth Industrial Revolution (Society 4.0) is evident in using various creative and innovative technology-based learning media, such as PowerPoint, videos, images, and learning applications. Additionally, the widespread use of digital sites or platforms that provide teaching and learning facilities is expected to positively impact learners from various fields, including Japanese language learners. Japanese learners without a cultural background in kanji often struggle due to the complexity of the characters and their similar shapes, which can lead to errors when writing (Bourke, 1996; Gamage, 2003; Grainger, 2005; Mulgrew, 2022). Limited class time results in a lack of practice writing kanji, making it more difficult for learners to combine multiple characters and use them in sentences (Sutedi, 2018; Diner & Prasetiani, 2015).

Practice outside the classroom can be an alternative to a kanji writing exercise. However, learners may become bored if the same type of exercise is repeated. To address this issue, interactive multimedia-based practice materials are needed to help learners practice and learn kanji more effectively and enjoyably. Smartphones are an example of interactive media that can be used as a learning tool. Using mobile phones to learn foreign languages is an effective method, whether with or without a teacher (Yu et al., 2013). Mobile devices can enhance traditional out-of-class learning by making it more interactive, adaptive, and tailored to meet the needs of learners, resulting in an optimal learning experience (Pambudi et al., 2018). There are currently several free apps available that teach students how to write kanji using an input-focused method. This method requires students to draw or write on the screen.

The order of kanji writing (hitsujun), the number of strokes, and the similarity between kanji characters make Japanese learners who do not have a background in kanji culture often make mistakes when writing kanji. This is confirmed by the results of a questionnaire that we distributed to 44 second-year students of the Japanese Language Education Study Program at one of the public universities in Bandung. These difficulties occur because kanji often contain too many strokes (kakusuu), and students may need to learn the correct stroke order (hitsujun) and may mix up the order of strokes. Additionally, students may need to learn how to write kanji correctly. To address these issues, practical strategies, methods, and learning materials are needed to help learners write kanji according to the correct stroke order. Previous research has identified several applications used in kanji learning (Amelia & Prasetyo, 2019; Basri & Yohari, 2022; Dani et al., 2023). However, to the researcher's knowledge, there needs to be research on Android-based applications used as a medium for practising Direct Corrective Feedback kanji writing. One kanji application that can fulfil these criteria is Hitokoma Kanji

The Hitokoma Kanji application is a free tool designed to enhance the kanji writing skills of elementary school students. The designer's explanation in the Play Store application states that the app is intended to be objective and unbiased in its approach to teaching kanji. It covers all the kanji taught in elementary school and supports the new curriculum.

(https://play.google.com/store/apps/details?id = com.goobee.KanjiMaster&hl=ja&gl=US)

The Hitokoma Kanji app offers several features. Firstly, it allows users to practice correct writing. Secondly, it presents questions through manga-style illustrations or drawings. Thirdly, it provides various fun sentences with a coherent structure. Fourthly, it facilitates effective kanji learning by providing clues gradually while users write and remember. Finally, it enables users to write letters that express hane and harai beautifully using a thick fude. The Hitokoma kanji app is designed for individuals who wish to improve their kanji reading and writing skills engagingly and enjoyably. The app is also appropriate for those interested in educational apps that make learning kanji more enjoyable. It is particularly suitable for elementary school students in grades 1- 6 seeking an alternative to traditional kanji practice materials. Japanese language teachers often need to pay more attention to providing detailed and direct feedback on kanji writing, both in and outside class. Correctly writing kanji is crucial for learners to improve their skills. Feedback is a recognized and effective tool for learning (Brookhart, 2017; Hattie & Timperley, 2007; Shute, 2008), and direct corrective feedback is one form of such feedback. Corrective feedback can draw learners' attention to discrepancies between their work and the target. Additionally, computer-mediated corrective feedback can aid in developing knowledge for second language learners (L2) (Sauro, 2021).

Kanji writing follows standardized rules that differ from writing Latin letters. It is crucial to obey and master the order of writing kanji lines or strokes order (hitsujun). Writing kanji with incorrect stroke order or direction can cause the kanji to be unbalanced and difficult to read (Nguyen et al., 2019). Direct corrective feedback is necessary to prevent errors in writing kanji. Direct corrective feedback informs the learner of any kanji writing errors and provides the correct answer. Mulgrew (2022) notes that direct feedback is beneficial because each kanji stroke depends on the correctness of the other parts. For instance, learners are taught to write kanji from the bottom instead of the top. This allows for immediate feedback on writing mistakes, preventing them from becoming bad habits.

Based on the explanation provided, researchers aim to verify that the Hitokoma Kanji App can be a technology-based alternative learning media in kanji learning, especially in kanji writing skills. This research addresses students' challenges in the Japanese Language Education Study Program at the University of Education Indonesia when writing kanji in the correct order (hitsujun) and form. The study proposes using the Hitokoma Kanji application, which provides direct corrective feedback on students' kanji writing.

METHODS

A. Research Methods

This research employs qualitative research methods with a descriptive approach. Descriptive research is conducted to describe a phenomenon that occurs today using scientific procedures to answer actual problems (Sutedi, 2018). Therefore, this research method is used to gain a more in-depth understanding of the learning process when using the Hitokoma Kanji app to assist in identifying areas where learners struggle or succeed.

B. Research Participants

The sampling technique used by researchers in this study is purposive sampling based on the researcher's considerations, with a specific purpose or purpose that can be scientifically accounted for (Sutedi, 2018). Researchers made criteria for research samples, namely students of the Japanese Language Education Study Program at Universitas Pendidikan Indonesia, who have an Android cellphone and can record screens on the cellphone. However, because not all mobile phones can screen record, participants can use two devices to record the kanji writing practice process using the Hitokoma Kanji application. In this study, the research samples were 14 participants in level II of the Japanese Language Education Study Program, Universitas Pendidikan Indonesia.

C. Research Instrument

The researcher utilized observation, assessment and documentation as data collection techniques. Indirect observation was conducted in this study. The author obtained observation data from screen recordings of each participant's cell phone while practising writing kanji in the Hitokoma Kanji application. This observation activity was conducted over four sessions, with each participant practising writing 10 kanji in each session. The assessment in this study used direct observation through screen recordings to evaluate the ability to write kanji on the hitokoma kanji application for four meeting sessions, where the researcher saw directly how participants wrote kanji and got direct corrective feedback from the hitokoma kanji application. Therefore, the total number of kanji that participants will write is 40 kanji. The kanji is based on the Hitokoma Kanji application at levels 10, 15, 19, and 21 in grade 2, as well as levels 2, 4, 17, and 18 in grade 3, namely 広、考、光、公、交、室、首、弱、社、時、切、星、晴、雪、船、太、地、台、体、池、意、院、員、飲、育、屋、開、荷、温、化、習、集、終、住、拾、重、所、暑、宿、助.

Participants were required to submit screen recordings via Google Drive, which the researcher had prepared. Assessment indicators were used to analyze participants' writing and facilitate researchers in processing observation data. These indicators included kanji writing by hitsujun/kakijun (strokes order in writing kanji) and the accuracy of writing basic strokes on kanji (ten, tatekaku or juukaku, *migiharai*, *hidariharai*, ore, hane, tome, magari). The Hitokoma Kanji application is displayed below:

RESULT AND DISCUSSION

A. Kanji Writing Inconsistencies with Hitsujun (strokes order in kanji writing)

Based on the observation, it is known that there are some kanji that are not written by the hitsujun based on the level order in grades 2 and 3 in the Hitokoma Kanji application, namely:

1. Kanji 広

Three participants needed to be corrected in writing the fourth strikethrough, where the participants wrote it separately (see Figure 1). Basically, according to Lory (2002), the fourth stroke belongs to the category of *nanamekagi* (ななめかぎ), which is a stroke followed by a diagonal line or a change in line direction or a line with a hook shape at the end. Therefore, it was corrected by the Extrusion/Lenght Check feature[1] and told the correct form. The correct way of writing the fourth hitsujun is to start with a slash written from the top centre to the bottom left and then draw the slash back to the top right. This will result in changes to the number, base form and hitsujun of the kanji 広 itself. Figure 2 is the correct order of writing kanji (hitsujun) kanji 広

[1] The Extrusion/Length Check feature is a feature that corrects or guides the writing of each scribble based on its order, shape, or length. In addition, this feature will automatically appear if the user writes the wrong kanji.

.

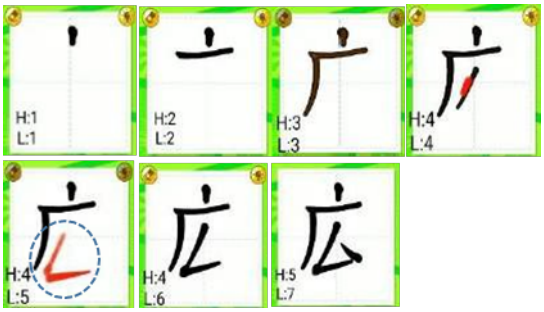

Figure 1. Kanji 広 written by participant 4


Figure 2. the correct way to write kanji 広

2. Kanji 公

Two out of 14 participants miswrote the third-order hitsujun. The participants wrote the third-order hitsujun separately in the tatekaku and yokokaku parts. From Figure 3, it can be seen that Participant 1 did not know the shape and hitsujun kanji 公, so Participant 1 used the Extrusion/Lenght Check feature continuously. From the results of the screen record, it can be seen that Participant 1 doubted writing the shape of the first scribble (H: 1, L: 1) because it was not long enough. Then the participant again used the Extrusion/Lenght Check feature to find out the second and third order of hitsujun kanji 公 (H:2, L:3) and (H:3, L:6), as well as the fourth order of hitsujun (H:4, L:8). Participant 5 hesitated to write the first sequence of hitsujun (H:1, L:1). Participant 5 is wrong in writing the third form of scribble, where the tatekaku and yokokaku parts are written separately (H:3, L:4). According to Lory (2002), the third sequence of hitsujun kanji 公 falls into the category of *nanamekagi* (ななめかぎ), which is a stroke followed by a diagonal line or a change in line direction or a line with a hook shape at the end. Therefore, it was corrected by the Extrusion/Lenght Check feature and told the correct form. The correct way of writing the third strikethrough is to start with a slash written from the top centre to the bottom left, then draw the slash back to the top right (Figure 5). This will result in a change in hitsujun, the number of hitsujun, and the basic shape of the hitsujun.

Figure 3.Kanji 公 written by participant 1

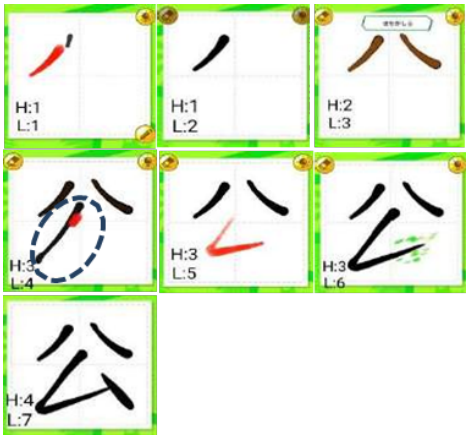

Figure 4.Kanji 公 written by participant 5

Figure 2. The correct way to write kanji 公

3. Kanji 交

Based on the observation of the screen record, it was found that three participants miswrote hitsujun. In this regard, there were five participants whose kanji writing was corrected directly by the Extrusion/Lenght Check feature. This is because the participants do not know the form and hitsujun of kanji 交, are wrong in measuring the length of the stroke, hesitant in writing a stroke, and wrong in writing the direction/position of a stroke.

On the other hand, two participants used the Hint Button feature when writing to find out the form of kanji referred to in the question on the exercise question. Furthermore, out of 14 participants, three people miswrote the primary form of the kanji 交. As explained in the previous paragraph, due to the participants' ignorance of the intended form of kanji in the questions on the exercise questions, the results of their kanji writing have a form that is not good or does not follow the general standard form of kanji 交. From Figure 6, it can be seen that Participant 10 was wrong in writing the direction/position of the first hitsujun (H:1, L:1); participant 10 should have written the first scribble in an upright position from top to bottom. Furthermore, the second kakijun (H:2, L:2), Participant 10 was hesitant to write the shape of the second hitsujun (H:2, L:3), so he used the Extrusion/Lenght

Check feature to be told the correct scribble. In addition, participant 10 used the Hint Button feature to find the overall shape of the kanji交 and the third hitsujun. Figure 7 is the correct hitsujun of kanji 交.

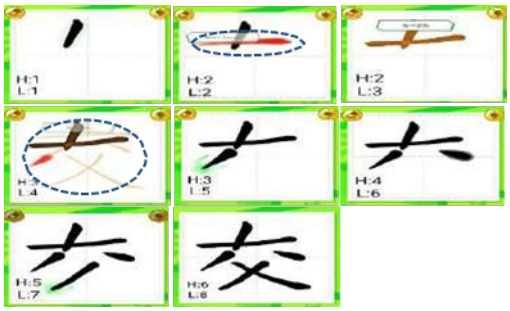

Figure 6. Kanji 交 written by Participant 8

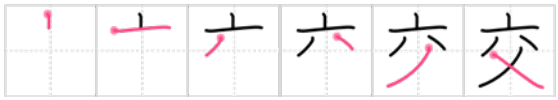

Figure 7. The correct way to write kanji 交

4. Kanji 考

In this kanji, the results obtained from two people needed to be corrected in the order of writing kanji (hitsujun). In this regard, all the kanji written by participant 3 were corrected by the Extrusion/Lenght Check feature (See figure 8, H5, L7; H;6, L10). This is due to the wrong size of the length of the squiggles, doubting in writing some squiggles on the kanji, and the lack of haneru form in the sixth stroke of hitsujun and the lack of haneru form in the sixth stroke of hitsujun. In addition, when writing these kanji, four participants used the Hint Button[1] feature to find out the form of the kanji referred to in the question in the application. Furthermore, five participants did not write graffiti according to the basic form of the graffiti. This is because the participants did not know the kanji form and did not write the haneru form at the end of the sixth stroke.

Four respondents used the hint button feature to identify the kanji character referenced in the question in this kanji writing exercise. In addition, due to their lack of knowledge, five out of 14 respondents needed to adhere to the basic form of the kanji character. Regarding its proper form, the haneru (to jump) form was omitted at the end of the sixth stroke.

According to Figure 8, Participant 3 used the Hint Button feature to identify the form and initial stroke of the kanji (H:1, L:1) at the beginning of writing. The kanji was written initially with a fifth-order hitsujun tilted too far to the bottom left. However, after utilizing the Extrusion/Length Check feature, the correct scribble (H:5, L:7) was indicated. The kanji was then rewritten with the correct hitsujun (H:6, L:11), thus correcting the previous mistake made according to the sixth-order hitsujun, which required a haneru form at the end of the writing (H:6, L:10). As shown in Figure 9, the correct hitsujun for the 考 kanji is now displayed.

[1] Hint Button is a hint feature that users can use when they find it difficult or forget how to write a kanji when using the Hitokoma kanji application

Figure 8. Kanji 考 written by participant 3

Figure 9. The correct way to write kanji 考

5. Kanji 室

Based on the observation results, it is known that out of 14 participants, seven did not write the kanji in the correct order (hitsujun). The Extrusion/Length Check feature corrected the kanji writing of 10 participants. This is because most of them had incorrect stroke lengths, doubted how to write specific strokes, needed to

familiarize themselves with the proper shape and order of the kanji, wrote angled strokes separately, and wrote strokes in the wrong or reverse order.

Two participants used the Hint Button feature to determine the shape and order of strokes for this kanji. In addition, due to their limited knowledge of the kanji presented in the Hitokoma Kanji application question, three participants needed help writing the kanji by separating the fifth stroke.

From Figure 10, Participant 5 may have erred in writing the fifth stroke form (H:5, L:5 with a blue circle) by writing separately in the tatekaku and yokokaku portions. Continuing to write it separately could alter the primary form of the kanji, increase the number of strokes, and affect the order of writing kanji (hitsujun). According to Lory (2002), the fifth stroke belongs to the category of *nanamekagi* (ななめかぎ), which is a stroke followed by a diagonal line, a change in line direction, or a hook-shaped line at the end. The stroke is written by starting with a slash from the top of the centre to the bottom of the left and then drawing a slash to the top of the right. In addition, the participants utilized the Extrusion/Length Check feature on H:7 and L:10 to determine the shape and order of the next scribble. Based on the data presented in Figure 10, it appears that despite utilizing the Extrusion/Length Check feature on sheet 8, the participant still made errors in the shape and position of the sixth scribble. However, the correct placement is at the end of the fifth scribble with a dot, as shown on H:6 and L:9.

Figure 10. Kanji 室 written by participant 5

Figure 11. The correct way to write kanji 室

6. Kanji 社

Based on the observation through the screen record, it is known that out of 14 participants, six of them did not write it according to the order of kanji writing (hitsujun). In this regard, there were eight participants whose writing was corrected by the Extrusion/Lenght Check feature. This is because they needed to remember the shape and hitsujun, incorrectly measured the length of the strokes, reversed the order of the strokes, wrote an angled stroke separately and hesitated to write strokes.

In addition, out of all participants, only one person used the Hint Button feature to find out the intended kanji form in the question. Furthermore, three people did not write squiggles according to the primary form of squiggles in kanji. The participants needed to remember the form and hitsujun kanji; the second scribble was written separately.

In Figure 13, it can be seen that Participant 2 used the Hint Button feature on L:1 to find out the kanji form. Then, on H:3 L:4 (circled and red

arrow), he wrote the wrong kanji form and order (*hitsujun*). The kanji 社 traditionally features a straight or vertical line (*tatekaku*) as its third stroke. However, in this instance, the participant mistakenly utilized a different form and order in the fourth stroke. Therefore, the Extrusion/Lenght Check feature corrects the mistake and tells the correct order and shape of the next squiggle. In addition, the participant wrote the seventh stroke less long on H:7 and L:10, which was corrected by the Extrusion/Lenght Check feature.

Figure 13. Kanji 社 was written by participant 2

Figure 14 shows that Participant 5 wrote the wrong form of the first stroke on H:1, L:1. The correct form should have been a ten (dot) written obliquely from top left to bottom right. However, the Hitokoma Kanji application did not detect the error. On H:2 and L:2, participant 5 used the Extrusion/Length Check feature to determine the shape of the following stroke by randomly touching or pressing the inside of the paper. On H:2 and L:3, participant 5 miswrote the second stroke by separating it into yokokaku and tatekaku. According to Lory (2002), the second stroke belongs to the category of *nanamekagi* (ななめかぎ), which is a stroke followed by a diagonal line, a change in line direction, or a hook-shaped line at the end. The stroke should be written from left to right and curved to the bottom left. Kamermans (2009) explains the correct way to write the second stroke of the hitsujun kanji 社 . The Extrusion/Length Check feature corrects errors and notifies the correct form of the next stroke. Figure 15 shows the correct form of the kanji.

Figure 14. Kanji 社 written by participant 5

Figure 15. The correct way to write kanji 社

7. Kanji 弱

Seven of the 14 participants needed to follow the correct order of kanji writing (hitsujun) in this kanji. As a result, 11 of them were corrected by the Extrusion/Length Check feature. The mistakes were due to forgetting the form and hitsujun, incorrect length, lack of knowledge of the form and hitsujun, hesitation in writing a kanji, lack of hangers form in a kanji, and incorrect writing of an angled kanji.

Only one participant used the Hint Button feature to find the intended kanji form in the question. Additionally, six out of 14 participants wrote kanji that did not match the shape of the squiggle. This was due to hesitation about the kanji form, lack of haneru form in the third and eighth strokes, and the separation of yokokaku and tatekaku in the third and sixth strokes.

Figure 16 illustrates an error in sheet 6, where Participant 10 (H:6, L:6) incorrectly wrote the sixth stroke by separating the tatekaku and yokokaku parts. According to Lory (2002), the

sixth stroke belongs to the category of kakukagi (かくかぎ), which is an angled stroke. This is consistent with Kamermans' (2009) classification of the sixth stroke as an angled stroke written from left to right and top to bottom. The Extrusion/Length Check feature corrected the error and notified the correct stroke shape.

Figure 16. Kanji 弱 written by participant 10

Figure 17 shows an error in H:8-9, L:9 where the participant 12 wrote the eighth stroke separately instead of as a *nanamekagi* stroke, which is a stroke followed by a diagonal line or a change in line direction or a hook-shaped line at the end, according to Lory (2002). Kamermans (2009) categorizes the eighth stroke as a multi-angled stroke written from top to bottom, then line dances from left to right, and finally from top to bottom with a serif (hook) pointing to the top left. The Extrusion/Length Check feature corrects the error, and the correct form of the following stroke is displayed. Figure 18 shows the correct hitsujun kanji 弱.

Figure 17. Kanji 弱 written by participant 12

Figure 18. The correct way to write kanji 弱

8. Kanji 星

Based on the observation, it is known that out of 14 participants, four needed to write their kanji in the correct order (hitsujun). Twelve of them had their kanji corrected directly by the Extrusion/Length Check feature because they needed to remember their kanji's correct shape and order, resulting in incorrect stroke length and doubting in writing.

Only one participant used the Hint Button feature to find the intended kanji form in the question. Additionally, all participants should have written their hitsujun in the basic form of the kanji. Some participants wrote the second stroke separately in the tatekaku and yokokaku parts, and others needed to learn the kanji form referred to in the question.

According to Figure 19, participant 10 incorrectly wrote the position/direction of the first squiggle on sheet 1. It should have been slanted inwards or to the bottom right. Additionally, in H:2 and L:2, Participant 10 wrote the wrong form of the second stroke by separating the yokokaku and tatekaku parts. As per Lory (2002), the second stroke belongs to the kakukagi (かくかぎ) category, which is a stroke

that has an angle. Kamermans (2009) categorizes the second stroke as an angled stroke, written from left to right and then top to bottom. The Extrusion/Length Check feature corrects the writing of the second stroke and provides the correct form. Writing the second stroke separately can alter the primary form of the kanji, increase the number of strokes, and create hitsujun kanji.

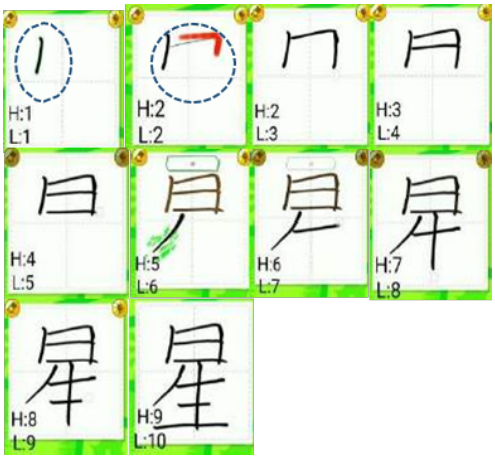

Figure 19. Kanji 星 written by participant 10

An error in writing the kanji 星 is shown in Figure 20. The participant wrote the sixth stroke with the prefix form tatekaku (vertical line), which is incorrect. The correct form for the sixth stroke (figure 21) is yokokaku (horizontal line). This error occurred due to confusion between the order and form of the sixth and seventh strokes. This is explained in H:6 and L:6. Also, participant 12 uses the extrusion/length check to determine shape and order. This can be observed at H:8 L:10, H:9 L12, and H:9 L:12, where the eighth and ninth strokes are presented.

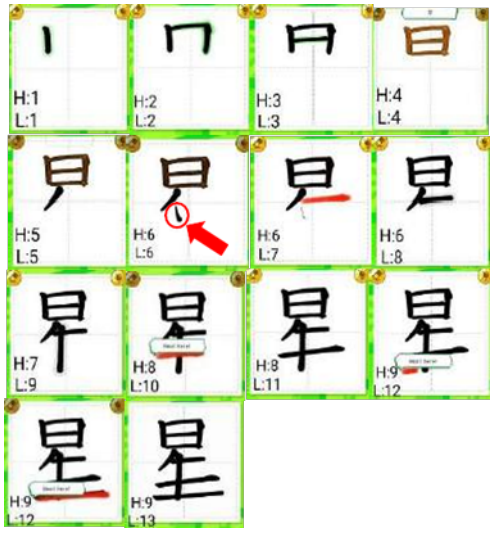

Figure 20. Kanji 星 written by participant 12

Figure 21. The correct way to write kanji 星

B. Accuracy of Basic Strokes in Kanji

This section analyzes the results of participants' kanji writing based on the strokes of *hidariharai* (Kanji line formed from the top right stroke then down to the bottom left with a hook at the end (ノ)) , *migiharai* (the kanji line formed from the upper left strokes is shaped triangle then down to the bottom right (㇏)), hane (vertical lines of kanji that form from the top then descend to the bottom with a hook that tends to rise (㇀)) , and ten (kanji lines look like dot (`)).

1. *Hidariharai* and *Migiharai* Strokes

In the kanji 船 (sen, fune, funa), eight participants did not follow the correct order of strokes (hitsujun). As a result, 13 participants had their kanji writing corrected using the Extrusion/Length Check feature. The lack of *migiharai* and *hidariharai* forms in most participants' writing is due to their indifference towards them.

As shown in Figure 22, the participants wrote the second strikethrough on H:2 and L:3 following the instructions of the Extrusion/Length Check feature, but the shape was too perpendicular. To improve this, the second strikethrough should be written slightly slanted towards the bottom left as a *hidariharai*. Additionally, the participant did not

write *migiharai* according to the basic form of the stroke on H:8, L:13. According to Lory (2002), the second scribble belongs to the category of nanamesen (ななめせん), which is a diagonal line. It should be written from top left to bottom suitable, as shown in Figure 23.

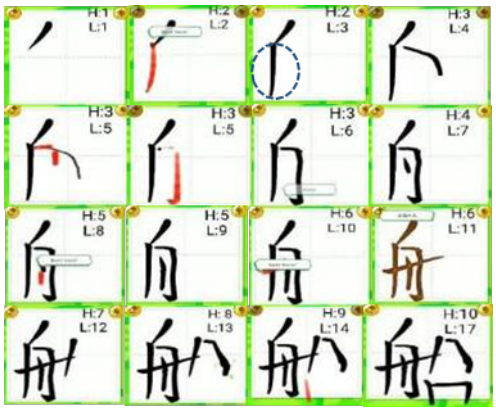

Figure 22. The example of a *migiharai* error in kanji 船

Figure 23. The correct way to write kanji 船

In the kanji 太 (ta, tai, dai, futon-i, futo-ru), the kanji writing of eight respondents were corrected by the Extrusion/Lenght Check feature because the *hidariharai* form in the second stroke was not good, and they did not know the shape and hitujun of the kanji. Three respondents wrote that their kanji did not match the primary form of the kanji strokes. The three respondents wrote that the *hidariharai* in the second stroke was not good or was not shaped like a *hidariharai*. Figure 24 is an example of miswriting the kanji 太; the second stroke has an inaccurate direction and length whereas the second stroke should have a *hidariharai* shape. According to Lory (2002), the second stroke is included in the nanamesen (ななめせん) category, namely diagonal lines. This second stroke is in italics from the top centre to the bottom left. The correct writing of the kanji 太 is shown in Figure 25.

Figure 24. The example of a *migiharai* error in kanji 太

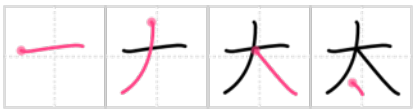

Figure 25. The correct way to write kanji 太

2. *Ten* Strokes

Some participants wrote the kanji 雪 not following *hitsujun*. It can be seen in Figure 26 (H:11, L:11) that there are the fourth, fifth, sixth, and seventh strokes with the form *ten* (dot) written not by the improper position. The correct hitsujun is found in Figure 27.

Figure 26. The example of a *migiharai* error in kanji 雪

Figure 27. The correct way to write kanji 雪

3. Haneru Strokes

One participant utilized the Hint Button feature to determine the overall kanji form. However, on H:4, L:5 they incorrectly wrote the fourth stroke without including the *haneru* form at the end. As a result, their writing was corrected using the Extrusion/Length Check feature. After receiving instructions from the Extrusion/Length Check feature, the participant failed to write

'*haneru*' (H:4, L:6) until the signboard appeared. On H:6, L:10 the participants was able to write the fourth stroke with the correct form. Additionally, although not detected by the application system, upon careful inspection of H:5, L:8, it is apparent that the participant wrote the fifth stroke too long. On H:6, L:10, the participant 6 wrote the sixth stroke too close to the fifth stroke, making it look like a single stroke. And the Extrusion/Length Check feature corrected the stroke and provided the correct kanji form.

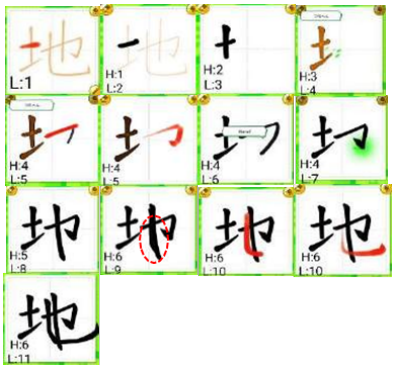

Figure 27. The example of a *haneru* error in kanji (The participant 6)

In addition to the example above, there was an error in writing the kanji 地. The writer did not pay attention to the part that should be written in haneru, which violates the rules of kanji writing (see Figure 28). On H:3, L:3, the participant 3 appeared hesitant in writing the shape of the third stroke and used the Extrusion/Length Check feature to confirm the shape of the stroke. Although the application system did not detect it, upon closer inspection of H:6, L:7, it is apparent that the participant did not include the haneru form at the end of the sixth stroke. As Lory (2002) explains, the seventh doodle belongs to the tsuribari (つりばり) category, which is a hook- shaped doodle. Meanwhile, Kamermans (2009) includes the seventh stroke into the category of angled strokes that are written from top to bottom, then left to right with serifs (hooks) that rise upwards at the end. Figure 29 shows the correct hitsujun kanji 地.

Figure 28. The example of haneru error in kanji 地 (Participant 3)

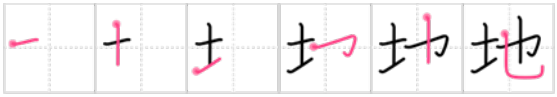

Figure 29. The correct way to write kanji 地

When writing kanji 意, it is recommended to pay attention to the haneru shape to avoid mistakes. As shown in Figure 30, the haneru shape function allows you to determine the shape and order of the first and 10th strokes (H:1, L:1 & L2 . The Extrusion/Length Check feature can also indicate the shape and alignment of the kanji if the user presses or touches the inside of the paper. This feature can be useful for ensuring accuracy in writing. On Sheet 3, the Hint Button feature can be used by participants to determine the general shape of the kanji and the shape of the third stroke. Furthermore, on H:11, L:14 (red circle), the eleventh stroke form was not correctly written by the participant as they omitted the haneru form at the end of their writing. As per Lory's (2002) classification, the eleventh stroke is considered as tekagi (てかぎ), which is a curved stroke that ends with a hook-shaped line. Meanwhile, Kamermans (2009) includes the eleventh stroke in the category of straight strokes, which are written from the top with a serif (hook) upward at the end of the writing. Therefore, the Extrusion/Length Check feature corrects the writing error and informs the correct form of the stroke. The correct Hitsujun Kanji意 image is shown in Figure 31.

Figure 30 The example of a haneru error in kanji 意 (The participant 7)

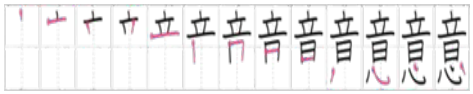

Figure 31. The correct way to write kanji 意

Next, we will discuss the writing of the kanji 院, which does not correspond to hitsujun. In Figure 32, sheet 1, the participants attempted to write the kanji by combining the first and second scribbles. On H:2 and L:2, the participant did not write the second stroke correctly, failing to include the haneru form at the end. As a result, the Extrusion/Length Check feature corrected the error and provided the correct stroke form. According to Lory (2002), the second stroke can also be categorized as tekagi (てかぎ), which is a curved stroke that ends with a hook-shaped line. Meanwhile, Kamermans (2010) categorizes the second stroke as a straight stroke written from the top left and then retracted at the end. Additionally, on sheet 7, the participant miswrote the sixth stroke. The Extrusion/Length Check feature corrects the error and provides the correct form of the stroke. According to Lory

(2002), the sixth stroke of hitsujun kanji 院 belongs to the category of *nanamekagi* (ななめかぎ), which is a stroke followed by a diagonal line, a change in line direction, or a hook-shaped line at the end. The correct writing method starts with a straight line from left to right, then draws a slash to the bottom left. Figure 33 depicts the correct hitsujun kanji 院.

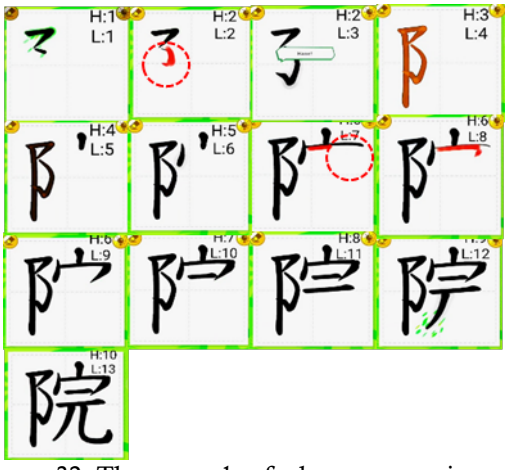

Figure 32. The example of a haneru error in kanji 院

CONCLUSION

This study analyzed kanji writing errors using the Hitokoma Kanji application. The basic stroke form in kanji that is often written incorrectly by the participants, namely angular strokes such as *nanamekagi* (フ, ム), *tekagi* (し), *Kakukagi* (冂, 乚), Kunoji (く), Tsubari (乚), *Hidariharai* (丿) and *Migiharai* (丶, 乀). Therefore, when practicing writing kanji in the Hitokoma Kanji application, they often use the Extrusion/Length Check feature to find out sequence and form of subsequent strokes in kanji. In addition, most of the participants' kanji writing was corrected by the Extrusion/Length Check feature. Apart from that, several participants used the Hint Button feature to find out the overall shape of the kanji. For example, certain strokes may not include the forms haneru, ten, *hidariharai*, and *migiharai*. Or angular strokes may be written as separate units.

The Extrusion/Length Check feature is designed to provide direct corrective feedback for certain errors, specifically related to stroke order and form, when writing kanji. This feature serves as a guide for application users and can automatically correct user errors in stroke order or form. This feature serves as a guide for users of the application, and it can automatically correct mistakes made by the user in stroke sequence or form.

ACKNOWLEDGEMENT

We want to express our sincere gratitude to the Japanese Language Education Study Program at Universitas Pendidikan Indonesia for their generous financial support, which made it possible to conduct and complete this study. Additionally, we would like to thank the Japanese Language Study Program students at FPBS UPI for their valuable participation in this research during the academic year of 2023/2024.

REFERENCES

Amalia, M. (2022). Inovasi Pembelajaran Kurikulum Merdeka Belajar Di Era Society 5.0 Untuk Revolusi Industri 4.0. In Seminar Nasional Sosial, Sains, Pendidikan, Humaniora (SENASSDRA) (Vol. 1, No. 1, pp. 1-6).

Amelia, M. (2019). Pengaruh Penggunaan Media Aplikasi KANBEN (KANJI NO BENKYOU) terhadap Kemampuan Penguasaan Kanji Level Shokyuu (Dasar) pada siswa kelas XI Bahasa SMA di Kota Surabaya Tahun Ajaran 2018/2019. Hikari Vol 3 No 2.

Basri, M. S., & Yohani, A. M. (2022). Pengaruh Aplikasi Poro Belajar Bahasa Jepang Kanji terhadapKemampuan Kanji pada Mahasiswa Prodi Pendidikan Bahasa Jepang FKIP Universitas Riau. Jurnal Onoma: Pendidikan, Bahasa, dan Sastra, 8(1), 225-231.

Bourke, B. (1996). Maximising efficiency in the kanji learning task. Unpublished doctoral thesis, University of Queensland, Australia

Brookhart, S. M. (2017). How to give effective feedback to your students. Ascd.

Dani, A., Rahayu, N., & Yohani, A. M. (2023). Efektivitas Penggunaan Aplikasi Quizlet Sebagai Media Pembelajaran Kanji. Jurnal Pendidikan Bahasa Jepang Undiksha, 9(1), 65-69.

Diner, L., & Prasetiani, D. (2015). The effectiveness of use the kanji cards in kanji shokyu learning. *Jurnal Penelitian Pendidikan*, 32(1).

Gamage, G. H. (2003). Perceptions of kanji learning strategies: Do they differ among Chinese character and alphabetic background learners?. Australian Review of Applied Linguistics, 26(2), 17-30.

Grainger, P. (2005). Second language learning strategies and Japanese: Does orthography make a difference?. System, 33(2), 327-339.

Hattie, J., & Timperley, H. (2007). The power of feedback. Review of educational research, 77(1), 81-112.

Kamermans, M. (2010). An Introduction to Japanese-Syntax Grammar & Language. Draft copy-based on grammar.nihongoresources.com.

Lory, H. H, Fair, J., & Yoshimura, K. (2002). Introduction to Kanji. University of Chicago.www.mementoslangues.fr/Japonais/Kanji/In tro-to-Kanji.pdf.

Nguyen, C. T., Nguyen, H. T., Mita, K., & Nakagawa, M. (2019). Robust and real-time stroke order evaluation using incremental stroke context for learners to write Kanji characters correctly. Pattern Recognition Letters, 121, 140-149.

Mulgrew, P. (2022). "*Corrective Feedback Timing in Kanji Writing Instruction Apps*". Honors Theses. 2574. https://digitalworks.union.edu/theses/2574

Pambudi, S., Sukardiyono, T., & Surjono, H. D. (2018). The development of mobile gamification learning application for Web programming learning. *In Journal of Physics: Conference Series* (Vol. 1140, No. 1, p. 012046). IOP Publishing.

Shute, V. (2008). Focus on formative feedback. *Review of Educational Research*, 78(1), 153–189. http://dx.doi.org/10.3102/003465430731379 5

Sutedi, D. (2018). Penelitian *Pendidikan Bahasa Jepang (Panduan bagi Guru dan Calon Guru dalam Meneliti Bahasa Jepang dan Pengajarannya)*. UPI Press, Humaniora.

Sauro, S. (2021). Computer-mediated corrective feedback and the development of L2 grammar. UMBC Education Department Collection.

Saxena, P., Papanikolaou, M., Pagone, E., Salonitis, K., & Jolly, M. R. (2020). Digital manufacturing for foundries 4.0. *In Light Metals 2020* (pp. 1019-1025). Springer International Publishing.

Yu, Y. S., Lin, Y. Y., Huang, Y. L., & Hsieh, W. H. (2013). The Evaluation of use the mobile phone learning English in Taiwan. *International Journal of information and education technology*, 3(2), 189.