

[Research Note]

***Complexity in learners' responses and teachers' questions  
in the chat  
—From synchronous online beginner Japanese classes conducted  
in China —***

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***Abstract:*** *This study explores learners' responses to teachers' questions in online classes by using the unique chat function available in online classes. The study analyzes the actual complexity of the teacher's questioning and its relationship to the number of learners' responses and response time. Three main findings emerged from the study: (1) the teachers' questions can be classified as "written in word," "written in phrase," or "written in sentence"; (2) teachers often ask "written in word" questions; and (3) "written in word" questions lead to shorter response times from learners in chat. The results of this study can serve as a basis for improving learners' response times in online classes.*

***Keywords:*** *Online Beginner Japanese; teachers' questions; complexity; chat; learner responses*

## **1. Introduction**

Prior to the outbreak of the COVID-19 pandemic, many learners in China were attending online classes to learn Japanese. While various types of online classes are available, this study specifically focuses on the widely used synchronous online beginner Japanese classes (hereafter referred to as “online classes”). Li (2022) points out that learners in online classes were not responding well to teachers’ questions in the chat, with only a few individuals providing answers. This study seeks to analyze the relationship between teachers’ questions and learners’ responses in the chat during online classes.

## **2. Previous Studies and Research Objectives**

### **2.1. Learners’ responses to teachers’ questions**

When analyzing the relationship between teachers’ questions and learners’ responses, the teachers’ questions are classified according to a commonly used method in research on Japanese language education: Open/Closed questions and Referential/Display questions. The criterion for classifying Open/Closed questions is based on the range of responses expected from learners. Specifically, learners typically respond to Closed questions with a simple “yes” or “no,” while Open questions allow for a broader range of answers. Referential questions are those where the teacher does not know the learner’s response in advance, while Display questions are those where the teacher already knows the answer. Despite these differences, both categories of questions share a common feature: they are designed to elicit learners’ responses.

Although these two methods of classifying teachers’ questions are concise, they have their limitations. Umechi (1994) mentions that the classification of Referential and Display questions may not be appropriate for classes where both the teacher and learners are native speakers of the same language and the negotiation of meaning in the target language is not relevant. In this study, both teachers and students are Chinese native speakers, so this classification may not be appropriate. Moreover, studies on the use of Open/Closed questions have found that Closed questions are overwhelmingly used (Lee & Kinzie, 2012). Therefore, to clarify the relationship between the teachers’ questions and the learners’ responses in this study, it is necessary to further subdivide the teachers’ questions.

Learners’ responses are essential in determining the complexity of the teachers’ questions. According to Horie and Yamamoto (2012), “the level of abstraction of the answer sought by the questioner” is one definition of “question complexity”. Kunichika et al. (2002) divide “question complexity” into three categories: complexity in understanding the text, complexity in understanding the question text, and complexity in composing the answer text. The first two are considered to be the complexity of the direct question text, while the latter is the complexity of the answer that the teacher’s question requires from the learner. In other words, it can be inferred that the complexity of the teacher’s questioning can be determined by the complexity of the answers required from the learner. Furthermore, Li et al. (2020) categorized teachers’ questions into “easy to answer” questions and “difficult to answer” questions.

Based on the aforementioned studies, it can be concluded that the teacher’s questions can be classified according to the learners’ responses. However, it is important to note that these

studies analyze the teachers' questions and learners' spoken responses in face-to-face classes, whereas the focus of this study is on online classes. It is known that learners' responses to teachers' questions in online classes differ from those in face-to-face classes, and therefore require separate investigation.

## 2.2. Learners' responses by chat

Previous studies have analyzed learners' spoken responses as their responses to the teacher's questions (Hayami, 2011). However, in online classes, learners are less likely to respond by voice and often write their answers in the chat. The use of chat in online classes has three advantages. First, learners feel less tense when responding to teachers' questions compared to face-to-face classes. Fukushima and Shimomura (2017) indicates that sixth-graders using a tablet terminal in a face-to-face class felt less tense than "raising hands and transmitting". In this study, writing in response to the teacher's questions through chat is considered an equivalent means. Therefore, it can be said that writing in response to the teacher's questions through chat contributes to alleviating tension among learners. Second, many learners can write in the chat at the same time, which is not possible in face-to-face classes. Third, teachers can quickly see what many learners are writing in the chat. Thus, online classes can overcome the limitations of studying learners' responses compared to face-to-face classes.

This study aims to analyze two types of learners' responses in online classes, based on the observable chat data: the number of learners who participate in the chat (hereafter referred to as "learners' response number") and learners' response time. This study is measured by limiting the time between the prompt and the first response.

## 2.3. Purpose of the Study

This study, like the previous research, classifies teachers' questions based on learners' responses. Given learners' tendency to write in the chat, this study places emphasis on the complexity of learners' written responses. The study proposes that the complexity of teachers' questions can be inferred from the complexity of learners' written responses in the chat. Accordingly, this study aims to address the following two research questions.

RQ (1) What is the complexity of the teachers' questions?

RQ (2) How does the complexity of the teachers' questions affect learners' response number and time?

## 3. *Materials and Methods*

### 3.1. Materials

This study collected recordings (25 lessons) of online classes between April and August 2021. In the 25 recordings, there are 5 teachers affiliated with school A, 2 teachers affiliated with school B, 1 teacher affiliated with school C, and 1 teacher (D) without affiliation. Except for teacher D' one lesson, this study collected recordings of three lessons per teacher. Each lesson ranged from 90 to 120 minutes and covered vocabulary, grammar, and practice. The longest lesson time was dedicated to vocabulary. The textbooks used in the lessons were "Sino-Japanese

exchange of Standard Japanese (Primary)” for school A’s teachers and teacher D, “Minna no Nihonggo Romanized Version” for school B’s teachers, and “Comprehensive Japanese” for school C’s teacher. All textbooks were in the Chinese version, and the names were translated into English for the purpose of this study. The learners and nine teachers were all native Chinese speakers, and the class sizes ranged from a minimum of 40 to a maximum of 58 learners per class.

### 3.2. Procedures

To begin with, this study examined lesson records and transcribed the teachers’ questions. The questions had to meet four conditions: (1) they had to be spoken with a rising intonation, (2) they had to be timely gapped after the teacher spoke, (3) they had to elicit written responses from learners in the chat, and (4) they had to be related to knowledge. The study then tallied the number of learners who responded and recorded the reaction time of the first learner to respond in the chat.

RQ (1) classified the teachers’ questions based on the complexity of the learners’ written chat responses. To clarify RQ (2), this study conducted a quantitative analysis to investigate the relationship between the teachers’ questions and learners’ response number and time.

## 4. Results

### 4.1. Teachers’ questions’ complexity and distribution

There was a total of 355 teachers’ questions in the collected data. Based on the complexity of the majority of learners’ written responses in the chat, the questions were classified into three categories: those that elicited single-word responses (referred to as ‘word’), those that elicited short phrase responses (referred to as ‘phrase’), and those that elicited full sentence responses (referred to as ‘sentence’). Here are some examples to illustrate the complexity of the teachers’ questions.

Most of the time, teachers asked questions in Chinese, but sometimes in Japanese. So, when giving examples, the original text of the teacher’s questions and what the learners wrote in the chat was showed. An English translation (by the author) is also shown below the original text. In examples, A~D are the teachers’ statements including questions. A~D are teachers, S are learners. The following numbers by S are the order of the responses.

- (1) Teacher B1 asked the learners how to pronounce the Japanese word, 「練習用」.
- 16:13 B1: 来考一下大家, 「れんしゅうよう」 是音读还是训读?  
It's a quiz. Is 「れんしゅうよう」 (ren syuu you) an on yomi or a kun yomi?
- 16:19 B1: 想一下是音読み呢, 还是训読み呢?  
Think about it. Is an on yomi? Or a kun yomi?
- 16:25 S1: 音  
yin
- 16:27 S2 and S3: 音 S4: 音读  
yin yin du
- 16:29 S5~S9: 音读  
yin du

16:29 B1: 对, 是音读词。

Yes, it's right. it's an on yomi.

Example (1)'s answer is “on yomi” in Japanese or “yin/ yin du” in Chinese. In response to teacher B1's question, nine learners wrote “yin” or “yindu” in Chinese. Based on the form of the learners' responses in chat, the Example (1) can be judged to be a “word” question.

(2) After explaining the Japanese vocabulary 「本」 (book), the teacher A4 asked the learners to translate the Chinese phrases.

13:52 A4: 这样吧, 来考一下大家短语吧, 我的书, 我的书怎么说呢?

Then I'll give you a short phrase quiz. “我的书” (my book), “我的书”, How do you say it in Japanese?

14:07 S1: 私の本

watashi no hon

14:12 S2: 私の本

watashi no hon

14:15 S3: 私の本

watashi no hon

14:16 S4: 私の本

watashi no hon

14:19 S5: 私の本

watashi no hon

14:21 S6: 私の本

watashi no hon

14:21 A4: わたしのほん叫做我的书哈

「わたしのほん」 is “我的书”.

In response to teacher A4's question, six learners wrote “watashi no hon” in chat. As can be seen from the complexity of learners' written responses, example (2) can be judged to be a “phrase” question.

(3) After explaining the Japanese vocabulary 「本」 (book), the teacher A1 asked the learners to translate the Chinese phrases.

13:57 A1: “我的书”怎么说? ”我的书” “我的书”。

How do you say “我的书” (my book) in Japanese? “我的书” “我的书” .

14:10 A1: “我的书”怎么说呢?

How do you say “我的书” in Japanese?

14:11 S1: わたしのほんです。 S2: 私の本です。

watashi no hon desu.

Watashi no hon desu.

14:16 A1: 诶, 对, 中间加个の就可以了, 是不是?

Yes. Just add 「の」. Is it right?

14:26 S3: 私の本。 S4: 私のほんです。

watashi no hon. watashi no hon desu.

Example (3) ' question is same as the example (2). However, one learner wrote in the phrase “watashi no hon” and three learners wrote in the sentence “watashi no hon desu.”in example (3). Therefore, example (3) is a “sentence” question.

As mentioned above, this study classified the teachers' questions according to the complexity of what most learners wrote in chat. Then, in order to clarify the distributional status of the complexity of teachers' questions, every teacher's questions with the complexity were counted (Table 1). The results show a total of 355 teacher questions in the collected data. More specifically, the results showed 273 “word” questions,31 “phrase” questions, and 51 “sentence” questions. Overall, it was found that “word” question was by far the most common.

**Table1. Teachers' questions' distribution by 9 teachers**

Teacher	“Word” (N)	“phrase” (N)	“Sentence” (N)
A1	63	12	4
A2	9	1	9
A3	48	1	9
A4	43	3	2
A5	35	0	0
B1	20	6	12
B2	31	3	7
C	12	3	15
D	12	1	1
Sum (N)	273	31	51

#### 4.2. Impact on learners' responses

Prior to examining the relationship between the three levels of complexity in teachers' questions and the number of responses from learners in the chat, a Kolmogorov-Smirnov test was conducted to assess the normality of the response data for each complexity level. The results showed that the data did not follow a normal distribution ( $p < 0.01$ ), and the Levene test confirmed that the variances were equal ( $p=0.021$ ). Therefore, a non-parametric Kruskal-Wallis test was used to analyze the effect of complexity on the number of responses across the three question types. The results indicated that the effect of complexity on the number of learners' responses was not significant ( $H = 5.263, p = 0.072 > 0.05$ ) (Table 2). Thus, there was no statistical difference in the number of responses in the chat among the three levels of complexity.

**Table 2. The result of the Kruskal-Wallis with learners' number**

	Median	Standard error	Multiple Comparison
“word”	3.00	0.00	NS
“phrase”	3.00	0.07	
“sentence”	3.00	0.02	

Similarly, prior to analyzing the relationship between the three levels of complexity in teachers' questions and learners' reaction time in the chat, a Kolmogorov-Smirnov test was performed to assess the normality of the reaction time data for each complexity level. The results indicated that the data did not follow a normal distribution ( $p < 0.01$ ), and the Levene test confirmed that the variances were equal ( $p = 0.009$ ). Therefore, a non-parametric Kruskal-Wallis test was used to examine the effect of complexity on reaction times across the three question types. The results showed that the effect of complexity on the number of learners' responses was not significant ( $H = 44.378$ ,  $p < 0.001$ ). However, pairwise comparisons using Bonferroni's adjustment revealed that there was a significant difference in reaction time between the 'word' questions and 'sentence' questions, with learners responding faster to the former. Table 3 presents the reaction times for each complexity level.

**Table 3. The result of the Kruskal-Wallis with learner's reaction time**

	Median	Standard error	Multiple Comparison
“word”	7.00	0.02	phrase > word sentence > word
“phrase”	12.00	0.32	
“sentence”	15.00	0.22	

## 5. Discussion

### 5.1. Distribution of the teachers' questions' complexity

The study divided the complexity of teachers' questions into 'word', 'phrase' and 'sentence'. As can be seen from the distribution, 'word' questions were predominant. The collection of lesson recordings showed that teachers spent a lot of time explaining vocabularies. The high distribution of complexity 'words' could be influenced by the high amount of time spent explaining vocabularies.

To prove it, this study calculated Pearson's product-rate correlation coefficient to examine the relationship between the amount of class time each teacher spent explaining the vocabularies in one lesson and the number of times each teacher asked the 'word' question in one lesson. The results confirmed that there was no relationship ( $r = 0.223$ ,  $N = 25$ ,  $p = 0.284 > 0.05$ ). Therefore, teachers' frequent use of 'word' questions is not related to the amount of class time spent explaining vocabularies. Therefore, it can be said that teachers tend to ask simple forms of complexity questions in the lessons as per the data collected by the study.

### 5.2. Distribution of learners' response

The results quantitatively revealed in 4.2 showed that learners responded more quickly to "word" questions in chat. The following deconstrues with examples.

(4) After explaining pronunciation of the Japanese vocabulary 「人」, the teacher A4 asked the learners to answer the pronunciation of 「人」 which one learned earlier.

29:07 A4: 在上节课的时候我们说过除了这个读音以外还有哪个读音? 人还可以读做什么?

It was said in previous lesson that “ren” (Chinese, ‘person’) can be pronounced as “hito” and there are other pronunciations of this word as well. what is another pronunciation of “ren”?

29:13 S1: じん

jin

29:15 S2: じん

jin

29:18 S3 and S4: じん

jin

29:18 A4: 对, 还可以读作「じん」。对不对。

Yes. It can be said jin. Is it right.

The Chinese vocabulary “ren” can be pronounced as “hito” and “jin” in Japanese. According to the complexity of the question, it can be determined that example (4) is a “word” question. The first learner responded in 6 seconds after the teacher A4’s question. In other words, the learner’s response time to the question in Example (4) is 6 seconds.

Example (2) in section 4 was also given by Teacher A4. Example (2) is a “phrase” question. By the first learner’s response time in chat, it can be said that Example (2) ‘s learner’s response time is 15 seconds. Although, under the same teacher and the same lesson, the learners’ response time to the “word” question was shorter than that to the “phrase” question.

The above revealed that the response time of learners in the chat was short for the “word” question. Based on the results, it can be inferred that when learners do not respond well in chat, adopting the “word” question can improve learners’ response situation.

## 6. Conclusion

In this study, the complexity of teachers’ questions was categorized as “word,” “phrase,” and “sentence,” and the analysis was focused on the learners’ written responses using the chat function in online classes, particularly the number of learners’ responses, learners’ response time, and the relationship with the complexity of the teachers’ questions. The findings indicated that learners’ reaction time to “word” questions was comparatively shorter.

Although the COVID-19 pandemic has now calmed down, and as a result, online classes continue to play a significant role in education. It is important to leverage the advantages of online classes in conjunction with traditional face-to-face classes. The findings of this study can help guide teachers in formulating effective questioning strategies in this new era of education.

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