Indonesian EFL University Students’
Metacognitive Online Reading Strategies
Before and During the Covid-19 Pandemic

Agus Rianto*

English Education Department, Faculty of Education and Teacher Training,
Universitas Borneo Tarakan, Tarakan 77123, INDONESIA

Abstract
This descriptive study focused on investigating the use of metacognitive
online reading strategies that were associated with learning conditions
before and during the Covid-19 Pandemic. The respondents were 244
Indonesian EFL students taking an English subject at the Borneo Tarakan
University. Data were collected using the Online Survey of Reading
Strategies (OSORS) through the application of Google Form. The
collected data were analyzed descriptively and quantitatively. The results
showed that before the pandemic, support strategies were used more
frequently, while global strategies were used less frequently. During the
pandemic, support strategies and problem-solving strategies were more
dominantly used, while global strategies remained the least used. Although
the students differed significantly in using the overall and categorical
strategies, they did not have differences in using some of the individual
strategies. The students were moderate users of the strategies before the
pandemic and were high users during the pandemic. These results imply
that EFL students need to have metacognitive awareness to help them
better understand what they read online. This can be done by involving
students more actively in the use of strategies, especially those that were
not different when used before and during the Covid-19 pandemic.

Keywords: EFL students, metacognitive strategies, reading, online,
Covid-19 Pandemic.

* Corresponding author, email: riant2@hotmail.com

Citation in APA style: Rianto, A. (2021). Indonesian EFL university students’ metacognitive online
reading strategies before and during the Covid-19 pandemic. Studies in English Language and
Education, 8(1), 16-33.

Received September 26, 2020; Revised December 2, 2020; Accepted December 3, 2020; Published
Online January 3, 2021

https://doi.org/10.24815/siele.v8i1.18110
1. INTRODUCTION

Educational institutions are currently facing a very challenging situation due to the rapid spread of the new coronavirus disease (Covid-19). On January 30, 2020, the Emergency Committee of WHO declared a global health emergency caused by the increasing spread of cases of this disease internationally (Velavan & Meyer, 2020). Since the end of February 2020, the disease has been detected in almost all continents and has become the daily headlines of world media (McAleer, 2020). One of the significant impacts of this pandemic on the education sector is the re-arrangement of face-to-face learning activities and the need for online learning exclusively (Moorhouse, 2020). To prevent the spread of this virus, almost all educational institutions around the world, including Indonesia, decided to carry out learning activities entirely online. In responding to this global situation, the Indonesian government through the Ministry of Education and Culture has instructed educational institutions in the country to carry out online learning since March 17, 2020 (Mendikbud, 2020). Furthermore, this new policy requires students and teachers to carry out learning activities from home, and these conditions certainly have an impact on students' social and academic development (Atmojo & Nugroho, 2020; Cao et al., 2020). The implementation of this education policy poses new challenges for most teachers and students in managing their learning activities (Amin & Sundari, 2020).

Studies on online learning in normal and general contexts have been carried out both quantitatively and qualitatively (Gonzales & St. Louis, 2018). However, studies that focus on online language learning associated with current pandemic situations are limited, especially those on metacognitive reading strategies in English as a Foreign Language (EFL) and higher education contexts. For EFL students, reading is an important skill that must be possessed to succeed in their academic process. Students with good reading skills have a greater chance of being successful in their academic fields (Anderson, 2003). In line with current technological developments, learners spend a lot of time reading and communicating online for both academic purposes or personal enjoyment (Marboot et al., 2020). It is believed that this online environment provides great opportunities for foreign language learners to try new learning experiences outside the classroom. Through appropriate exercises, students learning foreign languages online can increase their exposure to the material being studied and sharpen their language skills whenever and wherever they want.

While many studies have investigated the use of online reading strategies, not much research identifies and compares the use of metacognitive online reading strategies during the Covid-19 pandemic involving Indonesian EFL students. Much research on metacognitive reading strategies places more emphasis on normal learning conditions (Deliany & Cahyono, 2020). Therefore, the purpose of the present study was to investigate the use of metacognitive online reading strategies which were associated with learning conditions before and during the Covid-19 pandemic among Indonesian EFL university students. Specifically, the objectives of this study were to find out what metacognitive online reading strategies were used more frequently and less frequently by Indonesian EFL university students before and during the Covid-19 pandemic and to reveal whether there were significant differences in the use of these strategies before and during the Covid-19 pandemic. The following research questions are presented to address the research objectives:
1. What were the metacognitive online reading strategies that were used more frequently and less frequently by Indonesian EFL university students before and during the Covid-19 pandemic?
2. Did the students differ significantly in using these strategies before and during the Covid-19 pandemic?

2. LITERATURE REVIEW

This research is closely related to a theoretical framework of online language learning strategies. In the online learning environment, the literacy changes created by new technologies have been widely explored by researchers. Within this theoretical framework, reading is defined as problem-based inquiry involving new skills, strategies, and dispositions (Leu et al., 2004; Taki, 2016). Furthermore, Coiro and Dobler (2007) emphasized that reading is an independent text construction process that requires readers to use metacognitive strategies.

Metacognitive strategies have been defined in various studies related to reading skills. Sheorey and Mokhtari (2001) defined them as conscious, deliberate procedures while reading that involve self-examination and self-regulation, such as making judgments about cognitive needs. In the same view, Vandergrift (2002) asserted that these strategies are very important as they involve monitoring, organizing, and thinking about the language learning process. Furthermore, Anderson (2003) argued that the use of these strategies plays a more effective role in language learning because students understand how to organize their learning. O’Malley and Chamot (1990) even emphasized that without these strategies, learners do not have the opportunity to plan, monitor, and view their learning.

In line with the views of Sheorey and Mokhtari (2001) and Anderson (2003), the present study believes that through metacognitive knowledge students can produce critical reflections and evaluate their thinking which can lead to specific changes in the way they learn. To achieve maximum reading comprehension, students must be metacognitively aware of what they are doing. For example, when engaging in an online reading assignment, students should have metacognitive awareness by relating their strategies to their online goals. Phakiti (2008) claimed that metacognition is considered a predictor of reading comprehension ability because readers are aware of the means used to achieve their reading goals.

Studies on metacognitive online reading strategies have been carried out in the last two decades. Through the Online Survey of Reading Strategies (OSORS), Anderson (2003) investigated the use of these strategies among ESL and EFL learners. The results showed that EFL and ESL students did not differ significantly in their use of global reading strategies and support strategies; however, problem-solving strategies were more frequently used by EFL readers than ESL readers. Other researchers also adapted OSORS to examine the use of these strategies among EFL learners. Research among EFL university students in Iran revealed that problem-solving strategies were used most frequently and support strategies were used least frequently (Ahmadian & Pasand, 2017; Marboot et al., 2020; Taki & Soleimani, 2012). Similarly, Azmuddin et al. (2017) found that university students in Malaysia used problem-solving strategies the most followed by global and support reading strategies. Other researchers investigating these strategies among EFL students in the Middle East
also found that problem-solving strategies were the most frequently used (Darwish, 2017; Mukhlif & Amir, 2017; Omar, 2014). A slightly different result was reported by Ramli et al. (2011) who investigated adult students in Malaysia that global reading strategies were more frequently used, followed by problem-solving strategies and support strategies.

Furthermore, some of those researchers focused their analyses on differences in the strategy use based on different students’ characteristics such as gender, English proficiency level, and level of study. Ahmadian & Pasand (2017) reported that female students used more global online reading strategies, while males considered themselves more effective in reading text online. Wu (2014) found that female learners performed better on knowledge of metacognitive strategies, navigation skills, and printed reading assessments but not significantly better on electronic reading assessments. Taki & Soleimani (2012) reported that male and female students did not differ significantly in using the overall strategy, but they differed significantly in using several individual strategies. Regarding the level of study, Ramli et al. (2011) found that the first and second-semester students in Malaysia did not differ significantly in using these three strategy categories. Concerning English proficiency level, Cheng (2016) found that students with intermediate and advanced levels of English proficiency did not differ significantly in using the online reading strategies.

Meanwhile, several other researchers focused on examining the instructional effects of reading strategies on reading comprehension. In a study that investigated offline versus online reading strategy instruction, Huang (2014) found that online readers outperformed offline readers on overall reading comprehension. Zenotz (2012) found that strategy training affected learners’ online reading positively, but it did not affect the strategy use. In addition, Alsofyani (2019) who investigated how Saudi EFL students coped with the challenges of reading comprehension, found that metacognitive strategy-based activities positively affected students’ reading achievement. In an earlier study, Huang et al. (2009) found that support strategies contributed to most of the students’ improvement in reading comprehension. However, they failed to predict the increase in students’ understanding of more difficult texts.

None of the studies reviewed above involved EFL students from Indonesia. Studies on online reading strategies involving Indonesian EFL students are very important to carry out because they can provide valuable information for the development of English learning in this country. Besides, the results of such studies can also be used as references by EFL teachers, syllabus planners, and students to increase their awareness of metacognitive strategies because it will help achieve their foreign language learning goals effectively.

3. METHODS

English is one of the compulsory subjects offered by the general education unit at the University of Borneo Tarakan in Indonesia. It has been taught through blended methods. Through blended learning, students received various online reading assignments for the subject. The population of this study was Indonesian EFL students who took the English subject in the second or fourth semester of 2019/2020. A total of 244 students (180 females and 64 males) were taken as the research sample through a purposive sampling technique.
As this study is based on the theoretical framework of online language learning strategies, the Online Survey of Reading Strategies (OSORS) was used as its instrument for data collection. This instrument was adopted from Anderson (2003) and Pookcharoen (2009). It consisted of three categories: global reading strategies (17 items), problem-solving strategies (12 items), and support strategies (10 items). Since this study focused on the use of metacognitive online reading strategies before and during the Covid-19 pandemic, some modifications were made to this instrument. First, each strategy item of OSORS was modified into two statements, the first statement was added with the phrase ‘before the Covid-19 pandemic’ and the second was with a phrase ‘during the Covid-19 pandemic’. The following is an example of modification made to item 1 of the global reading strategy of the original OSORS ‘I had a purpose in mind when I read online’. This item was modified into two statements: ‘Before the Covid-19 pandemic, I had a purpose in mind when I read online’ and ‘During the Covid-19 pandemic, I had a purpose in mind when I read online’. In addition, since this study was purposively intended for Indonesian EFL students, three items of the support strategies (items 37, 38, and 39) were modified by adding the following phrases to the respective items ‘into Indonesian’, ‘both English and Indonesian’, and ‘in Indonesian’. For item 37, it was modified into ‘Before the Covid-19 pandemic, when reading online, I translated from English into Indonesian’ and ‘During the Covid-19 pandemic, when reading online, I translated from English into Indonesian’. Item 38 became ‘Before the Covid-19 pandemic when reading online, I thought about information in both English and Indonesian’ and ‘During the Covid-19 pandemic, when reading online, I thought about information in both English and Indonesian’. Item 39 was changed into ‘Before the Covid-19 pandemic, when I encountered difficult reading in English, I sought material on the same topic in Indonesian’ and ‘During the Covid-19 pandemic when I encountered difficult reading in English, I sought material on the same topic in Indonesian’.

The reliability coefficient values for each of the strategy category and the overall strategy are as follows: global reading strategies before the Covid-19 pandemic (.879), global reading strategies during the Covid-19 pandemic (.911), problem-solving strategies before the Covid-19 pandemic (.873), problem-solving strategies during the Covid-19 pandemic (.891), support strategies before the Covid-19 pandemic (.845), support strategies during the Covid-19 pandemic (.862), the overall strategies before the Covid-19 pandemic (.944), and the overall strategies during the Covid-19 pandemic (.954). These reliability coefficient values are consistent with those reported by Anderson (2003) and Pookcharoen (2009) that for overall OSORS was greater than .90 and for each strategy category was higher than .60, indicating that the instrument for this study was reliable to measure the use of metacognitive online reading strategies.

Data were collected through a google form application which was carried out with the help of English lecturers who shared the form link with their students. The students were asked to fill out the questionnaire outside of their lesson hours. In the first part of the questionnaire, the students were asked to complete background questions. In the next part, the students were required to respond to each strategy item by clicking one of the numbers 1-5 (1 = never or almost never, 2 = only occasionally, 3 = sometimes (50% of the time), 4 = usually, and 5 = always or almost always). Overall, the questionnaire took about 20 minutes to complete. Because it involved
students from several different classes, the data collection was carried out for nine days.

Data were analyzed descriptively and quantitatively with the help of SPSS version 14.0. A descriptive analysis was conducted to answer the first research question by comparing the mean scores of the strategy use. A quantitative analysis was performed through t-tests (paired-sample tests) to answer the second research question, where the p-value of 0.05 was used in this study.

4. RESULTS

The first research question was intended to find out what metacognitive online reading strategies were used more frequently and less frequently by Indonesian EFL university students before and during the Covid-19 pandemic. Overall, the metacognitive online reading strategies in this study consisted of 39 items. These strategies were divided into three categories: global reading strategies (17 items), problem-solving strategies (12 items), and support strategies (10 items). Tables 1 and 2 illustrate the top 12 and bottom 12 strategies students used before and during the Covid-19 pandemic. Before the pandemic, seven of the top 12 strategies used were support strategies, and the other five were problem solving strategies. Meanwhile, nine of the bottom 12 strategies used before this pandemic were global strategies, followed by two problem solving strategies and one support strategy. During the pandemic, problem solving strategy and support strategy was the most widely used among the top 12 strategies, with five strategies each, followed by two global strategies. Meanwhile, six of the bottom 12 strategies used were global strategies, followed by four problem-solving strategies and two support strategies.

Table 1. Use of metacognitive online reading strategies before the Covid-19 pandemic.

| Top twelve strategies | Mean | Bottom twelve strategies | Mean |
|-----------------------|------|--------------------------|------|
| Support strategy 6    | 3.51 | Global strategy 3        | 2.30 |
| Problem solving strategy 3 | 3.55 | Global strategy 10       | 2.73 |
| Support strategy 1    | 3.55 | Global strategy 12       | 2.92 |
| Support strategy 5    | 3.57 | Global strategy 2        | 3.02 |
| Problem solving strategy 4 | 3.65 | Global strategy 13       | 3.09 |
| Problem solving strategy 1 | 3.67 | Support strategy 2       | 3.11 |
| Support strategy 9    | 3.70 | Global strategy 7        | 3.13 |
| Support strategy 10   | 3.72 | Global strategy 1        | 3.21 |
| Problem solving strategy 7 | 3.72 | Problem solving strategy 10 | 3.22 |
| Problem solving strategy 2 | 3.74 | Global strategy 6        | 3.27 |
| Support strategy 8    | 3.81 | Problem solving strategy 5 | 3.28 |
| Support strategy 4    | 3.91 | Global strategy 9        | 3.31 |

Table 2. Use of metacognitive online reading strategies during the Covid-19 pandemic.

| Top twelve strategies | Mean | Bottom twelve strategies | Mean |
|-----------------------|------|--------------------------|------|
| Problem solving strategy 3 | 3.68 | Global strategy 3        | 2.57 |
| Global strategy 5     | 3.70 | Global strategy 10       | 2.95 |
| Support strategy 5    | 3.73 | Global strategy 12       | 3.12 |
| Support strategy 9    | 3.74 | Support strategy 2       | 3.18 |
The second research question focused on finding out whether the students differed significantly in using the strategies before and during the Covid-19 pandemic. The results of t-tests for the strategy use are reported in Tables 3-6. For the overall metacognitive online reading strategies, as shown in Table 3, a significant difference was found when these strategies were used before and during the Covid-19 pandemic (p = .000). The students reported higher overall use of the strategies during the pandemic, as indicated by the difference in mean scores (before pandemic = 3.3790, during pandemic = 3.5399). These results also indicate that the students were moderate users of the strategies before the pandemic and became high users during the pandemic.

Table 3. Differences on overall metacognitive online reading strategy use before and during the Covid-19 pandemic.

| Strategy item | Before pandemic | During pandemic | t     | df  | Sig. (2-tailed) |
|---------------|-----------------|-----------------|-------|-----|----------------|
| Overall strategies | 3.3790 | 3.5399 | -6.846 | 243 | .000* |

*Differences were significant at .05

For the global reading strategy category, as shown in Table 4, the p-values of all the 17 strategy items were less than .05, meaning that there were no significant differences in the strategies used before and during the pandemic, either individually or categorically. Categorically, the students reported higher use of global reading strategies during the pandemic than before the pandemic, as indicated by the difference in the mean scores (overall global strategy before pandemic = 3.1905, overall global strategy during pandemic = 3.4226).

Table 4. Differences in global reading strategy use before and during the Covid-19 pandemic.

| Strategy item   | Before pandemic | During pandemic | t     | df  | Sig. (2-tailed) |
|-----------------|-----------------|-----------------|-------|-----|----------------|
| Global strategy 1 | 3.21 | 3.58 | -7.039 | 243 | .000* |
| Global strategy 2 | 3.02 | 3.45 | -6.603 | 243 | .000* |
| Global strategy 3 | 2.30 | 2.57 | -4.437 | 243 | .000* |
| Global strategy 4 | 3.34 | 3.62 | -5.839 | 243 | .000* |
| Global strategy 5 | 3.42 | 3.70 | -5.789 | 243 | .000* |
| Global strategy 6 | 3.27 | 3.48 | -4.544 | 243 | .000* |
| Global strategy 7 | 3.13 | 3.33 | -4.763 | 243 | .000* |
| Global strategy 8 | 3.48 | 3.77 | -6.014 | 243 | .000* |
| Global strategy 9 | 3.31 | 3.58 | -5.818 | 243 | .000* |
| Global strategy 10 | 2.73 | 2.95 | -5.002 | 243 | .000* |
For the problem-solving strategy category, as seen in Table 5, there was a significant difference in the overall strategies used before and during the Covid-19 pandemic (p = .000). Significance differences were also found in some individual problem-solving strategies (items 1, 2, 3, 4, 5, 6, 7, 10, 11), as indicated by their mean scores which were less than .05. By category, the use of problem solving strategies during the pandemic were reported to be higher than before it, as indicated by the difference in the mean scores (overall problem solving strategy before pandemic = 3.4915, overall problem solving strategy during pandemic = 3.6212).

Table 5. Differences in problem solving strategy used before and during the Covid-19 pandemic.

| Strategy item               | Before pandemic | During pandemic | t     | df  | Sig. (2-tailed) |
|-----------------------------|-----------------|-----------------|-------|-----|-----------------|
| Problem solving strategy 1  | 3.67            | 3.86            | -3.828| 243 | .000*           |
| Problem solving strategy 2  | 3.74            | 3.84            | -2.337| 243 | .020*           |
| Problem solving strategy 3  | 3.55            | 3.68            | -3.077| 243 | .002*           |
| Problem solving strategy 4  | 3.65            | 3.84            | -4.390| 243 | .000*           |
| Problem solving strategy 5  | 3.28            | 3.41            | -2.442| 243 | .015*           |
| Problem solving strategy 6  | 3.34            | 3.47            | -3.278| 243 | .001*           |
| Problem solving strategy 7  | 3.72            | 3.89            | -3.310| 243 | .001*           |
| Problem solving strategy 8  | 3.41            | 3.49            | -1.748| 243 | .082            |
| Problem solving strategy 9  | 3.35            | 3.39            | -.824 | 243 | .410            |
| Problem solving strategy 10 | 3.22            | 3.36            | -3.077| 243 | .002*           |
| Problem solving strategy 11 | 3.45            | 3.62            | -4.552| 243 | .000*           |
| Problem solving strategy 12 | 3.51            | 3.61            | -2.684| 243 | .008            |
| Overall problem solving strategy | 3.4915   | 3.6212           | -4.990| 243 | .000*           |

*Differences were significant at .05
The results of t-tests for individual and overall support strategies used by the students before and during the Covid-19 pandemic is illustrated in Table 6.

### Table 6. Differences in support strategy use before and during the Covid-19 pandemic.

| Strategy item         | Mean score | t         | df  | Sig. (2-tailed) |
|-----------------------|------------|-----------|-----|-----------------|
| Before pandemic       |            | During pandemic |     |                 |
| Support strategy 1    | 3.55       | 3.61      | -.988 | 243 .324        |
| Support strategy 2    | 3.11       | 3.18      | -1.812 | 243 .071        |
| Support strategy 3    | 3.36       | 3.41      | -1.967 | 243 .335        |
| Support strategy 4    | 3.91       | 3.99      | -2.107 | 243 .036*       |
| Support strategy 5    | 3.57       | 3.73      | -3.622 | 243 .000*       |
| Support strategy 6    | 3.51       | 3.59      | -1.764 | 243 .079        |
| Support strategy 7    | 3.41       | 3.50      | -2.502 | 243 .013*       |
| Support strategy 8    | 3.81       | 3.90      | -2.454 | 243 .015*       |
| Support strategy 9    | 3.70       | 3.74      | -1.092 | 243 .276        |
| Support strategy 10   | 3.72       | 3.77      | -1.180 | 243 .239        |
| Overall support strategy | 3.5648   | 3.6418   | -3.002 | 243 .003*       |

*Differences were significant at .05

For the support strategy category, as illustrated in Table 6, there appeared significant differences in four of the total 10 strategies students used before and during the Covid-19 pandemic. Differences in use appeared on support strategies 4, 5, 7, and 8 and did not appear on support strategies 1, 2, 3, 6, 9, and 10. However, no significant difference was found in the overall strategies when used before and during the pandemic. Students reported higher use of support strategies during the pandemic, as indicated by the difference in the mean score (overall support strategy before pandemic = 3.5648, overall support strategy during pandemic = 3.6418).

5. DISCUSSION

The results of this study contribute to an understanding of how metacognitive online reading strategies used by Indonesian EFL university students when they read their academic materials. First, it identifies the types of online metacognitive reading strategies that were used more frequently and less frequently before and during the Covid-19 pandemic. Second, it presents scientific data about the differences in the online reading strategies when used by the students in these two different circumstances.

Support strategies were more frequently used by EFL Indonesian students in their online academic reading before and during the Covid-19 pandemic. The dominance of the use of these strategies by the students in the two different situations was most likely due to the high use of basic support mechanisms to assist their reading comprehension. This was indicated by the high use of reference materials such as online dictionaries to help them understand what they were reading online. In addition, basic support mechanisms that involved the use of the Indonesian language were also a major factor in why these support strategies were used more by the students before and during the Covid-19 pandemic. This could be seen from the high score obtained by the three items of support strategies among the top 12 strategies students used. The
three strategies were students translating from English to Indonesian when reading online (item 8), students looking for material on the same topic in Indonesian when having difficulty reading in English (item 10), and students thinking about information in English and Indonesian when reading online (item 9). These findings are consistent with the findings of several previous studies, although several other studies have found that problem solving strategies were more widely used by EFL students (Ahmadian & Pasand, 2017; Anderson, 2003; Azmuddin et al., 2017; Darwish, 2017; Marboot et al., 2020; Mukhlif & Amir, 2017; Omar, 2014; Taki & Soleimani, 2012).

Another interesting finding to discuss here is the emergence of problem-solving strategies as a strategy category that was used more frequently after support strategies during the Covid-19 pandemic. Of the top 12 strategies most used by the students, problem-solving strategies were in the second highest position after support strategies. These findings indicated that after using basic support mechanisms to aid their reading comprehension, Indonesian EFL students worked directly with the text to solve problems while reading. Here are the problem-solving strategies that the students used more often: when online text becomes difficult, the students reread it to increase their understanding (item 7), the students read slowly and carefully to make sure they understood what they were reading online (item 1), the students tried to get back on track when they lost concentration (item 2) when the online text became difficult, the students paid more attention to what they read (item 4), and the students adjusted their reading speed according to what they read online (item 3). This could be influenced by the implementation of the fully online learning policy during the Covid-19 pandemic. In this situation, when students were given online reading assignments, they could perceive it as problem-based tasks that involved the process of constructing text in their minds. Several previous studies also reported similar reasons why EFL students more often used problem-solving strategies, in addition to students needing new skills and strategies (Coiro & Dobler, 2007; Leu et al., 2004; Pookcharoen, 2009).

The results of the present study regarding the strategies used before the Covid-19 pandemic have contributed to adding scientific information to the theoretical framework of new literacy, especially under normal learning conditions. According to Leu et al. (2004), reading in this theoretical framework is defined as a problem-based inquiry involving new skills, strategies, and dispositions. Besides, the findings in this study also contribute to complement the lack of scientific data regarding the use of metacognitive online reading strategies in the context of higher education and learning situations that are not normal due to the Covid-19 pandemic.

Further analysis in this research showed that the overall use of the strategies during the pandemic was higher than before the pandemic, with a significant difference. This higher strategy usage intensity was likely also influenced by the implementation of the study/work from the home policy during the Covid-19 pandemic. The policy requires adjustments in learning practices with the wider use of online models in almost all educational institutions. This finding strengthens the global phenomenon caused by the spread of Covid-19 in the educational practices that face-to-face learning activities were replaced exclusively by online learning (Moorhouse, 2020).

It was noted that the students differed significantly in using several individual problem solving strategies and support strategies. Readers usually use problem-solving strategies to help them solve problems faced in reading comprehension. Whereas support strategies are used when the problem-solving strategies are not
sufficient to reach an understanding. Some of the problem-solving strategies that were reported experiencing no difference were guessing the meaning of unknown words or phrases, skipping words or passages that they found difficult or unknown, and looking for sites that discussed both sides of the problem. Meanwhile, the support strategies that had no differences were: taking notes, reading aloud, printing a copy of online text then underlining or circling information, going back and forth in online texts to find connections between ideas, thinking about information in English and Indonesian, and looking for materials on the same topic in Indonesian. These results indicate that for a number of individuals uses of support strategies and problem-solving strategies, the implementation of the learning from the home policy during the Covid-19 pandemic did not have any significant effect. This could be due to students having insufficient exposure to the strategies or poor online learning infrastructure. Concerning online learning infrastructure, a recent study found that one of the main problems faced by the EFL Indonesian students in their online classes in blended learning was poor internet connection (Rianto, 2020). Previous research also revealed that factors such as reading strategy instructions, opportunities to use strategies, and internet network quality influenced online reading strategy use (Marboot et al., 2020). More specifically, Taki (2016) emphasized that in an online environment, students must learn to develop effective strategies because online competence is more than just technical knowledge. These results imply that the application of online learning programs should be made by integrating high-level cognitive skills to get more effective online reading comprehension.

It was also found that the respondents were identified as moderate users of the strategies before the Covid-19 pandemic and became high users during the pandemic. This strategy user categorization is based on Oxford (1990) scale which consists of three levels: high usage (mean scores of 3.5-5.0), moderate usage (mean scores of 2.5-3.4), and low usage (mean scores of 1.0-2.4). The implementation of the online learning policies during the pandemic seemed to affect the increase of students’ strategy use. This could be an indication that most of the students in this study were metacognitively aware of what they were doing when reading online academic materials to improve their reading comprehension. According to Mukhlif and Amir (2017), having metacognitive awareness when reading helps students become more proficient readers and achieve significant gains in reading comprehension.

The results of this study generally emphasize the importance of EFL students to have metacognitive awareness to help them better understand what they read online. The main practical implication of this research findings is to increase metacognitive awareness through teaching metacognitive strategies by involving students in exercises and online learning tasks. In particular, the student involvement in strategy training can be focused on the strategies that were identified as having no difference when used before and during the Covid-19 pandemic.

In addition, to get better online learning outcomes, the government and related educational institutions need to improve the quality of online learning infrastructures, especially internet connectivity. More importantly, in creating an effective online learning environment, English instructors need to vary the online learning features that can accommodate the preferences of their students. The use of online features that meet student preferences is believed to increase students’ involvement in learning and to create a more positive view of online learning. In a recent study on the use of online platforms and applications during the Covid-19 pandemic, Amin and Sundari (2020)
identified several online applications that received very positive ratings from Indonesian EFL students such as the Cisco WebEx Meeting, Google Classroom, and WhatsApp. This application may need to be considered by EFL instructors to add to the variety of online applications that they have already used.

6. CONCLUSION

This study has provided information regarding the metacognitive online reading strategies used by EFL Indonesian students before and during the Covid-19 pandemic. Before the pandemic, the support strategies were more frequently used by the students, whereas the global strategies were less frequently used. During the pandemic, support strategies and problem-solving strategies were more widely used, while global strategies remained the least used.

Students differed significantly in overall and category use of metacognitive online reading strategies between before and during the Covid-19 pandemic. However, in a number of individual problem-solving strategies and support strategies, the students did not differently use between the two different learning situations. The learners were moderate users of the strategies before the pandemic and became high users during the pandemic.

Because the analysis in the study was not differentiated based on student characteristics, further studies are suggested to analyze the same topic but based on different student characteristics such as gender, level of English proficiency, level of study, and study program. Apart from only involving EFL students as respondents, further research on this topic is suggested to involve EFL teachers. The comparison of strategy usage between EFL teachers’ and EFL students’ needs to be investigated. Such analysis is essential to gain a more comprehensive understanding of how various EFL readers use these types of strategies at the tertiary level.

ACKNOWLEDGMENTS

This study is supported by the 2020 grant from the University of Borneo Tarakan.

REFERENCES

Ahmadian, M., & Pasand, P. G. (2017). EFL learners’ use of online metacognitive reading strategies and its relation to their self-efficacy in reading. Reading Matrix: An International Online Journal, 17(2), 117-132.

Alsofyani, A. H. (2019). Examining EFL learners’ reading comprehension: The impact of metacognitive strategies discussion and collaborative learning within multimedia E-book dialogic environments [Unpublished doctoral dissertation]. University of South Florida.

Amin, F. M., & Sundari, H. (2020). EFL students’ preferences on digital platforms during emergency remote teaching: Video conference, LMS, or messenger application?. Studies in English Language and Education, 7(2), 362-378.
Anderson, N. (2003). Scrolling, clicking, and reading English: Online reading strategies in a second/foreign language. *The Reading Matrix, 3*(3), 1-33.

Atmojo, A. E. P., & Nugroho, A. (2020). EFL classes must go online! Teaching activities and challenges during COVID-19 pandemic in Indonesia. *Register Journal, 13*(1), 49-76.

Azmuddin, R. A., Nor, N. F. M., & Hamat, A. (2017). Metacognitive online reading and navigational strategies by science and technology university students. *GEMA Online Journal of Language Studies, 17*(3), 18-36.

Cao, W., Fang, Z., Hou, G., Han, M., Xu, X., Dong, J., & Zheng, J. (2020). The psychological impact of the COVID-19 epidemic on college students in China. *Psychiatry Research, 287*, 1-5.

Cheng, R. T. J. (2016). Reading online in foreign languages: A study of strategy use. *International Review of Research in Open and Distance Learning, 17*(6), 164-182.

Coiro, J., & Dobler, E. (2007). Exploring the online reading comprehension strategies used by sixth-grade skilled readers to search for and locate information on the Internet. *Reading Research Quarterly, 42*(2), 214-257.

Darwish, I. (2017, January). *Meta cognitive strategy use: Off or on in online reading* [Paper presentation]. International Conference on Literature, History, Humanities and Social Sciences (LHHSS-17), Dubai, Uni Emirate Arab. [https://doi.org/10.15242/ICEHM.ED0117029](https://doi.org/10.15242/ICEHM.ED0117029)

Deliany, Z., & Cahyono, B. Y. (2020). Metacognitive reading strategies awareness and metacognitive reading strategies use of EFL university students across gender. *Studies in English Language and Education, 7*(2), 421-437.

Gonzales, D., & St. Lous, R. (2018). Online learning. In J. Liontas & M. DelliCarpini (Eds.), *The TESOL encyclopedia of English language teaching* (pp. 1-6). John Wiley & Sons, Inc.

Huang, H. C. (2014). Online versus paper-based instruction: Comparing two strategy training modules for improving reading comprehension. *RELC Journal, 45*(2), 165-180.

Huang, H. C., Chern, C. L., & Lin, C. C. (2009). EFL learners’ use of online reading strategies and comprehension of texts: An exploratory study. *Computers and Education, 52*(1), 13-26.

Leu, D. J., Kinzer, C. K., Coiro, J., & Cammack, D. (2004). Toward a theory of new literacies emerging from the internet and other ICT. In R. Ruddell & N. Unrau (Eds.), *Theoretical models and processes of reading* (5th ed.) (pp. 1570-1613). International Reading Association.

Marboot, K., Roohani, A., & Mirzaei, A. (2020). Investigating Iranian EFL students’ metacognitive online reading strategies, critical thinking, and their relationship: A mixed-methods study. *Issues in Language Teaching (ILT), 9*(1), 151-182.

McAleer, M. (2020). Prevention is better than the cure: Risk management of COVID-19. *Journal of Risk and Financial Management, 13*(3), 46.

Mendikbud. (2020). Surat edaran Mendikbud: Pembelajaran secara daring dan bekerja dari rumah dalam rangka pencegahan penyebaran coronavirus disease (COVID-19) [Minister of Education and Culture Circular: Learning online and working from home in order to prevent the spread of the coronavirus disease (COVID-19)]. [http://kemdikbud.go.id/main/files/download/51e9b72ef92c6d8](http://kemdikbud.go.id/main/files/download/51e9b72ef92c6d8)
Moorhouse, B. L. (2020). Adaptations to a face-to-face initial teacher education course ‘forced’ online due to the COVID-19 pandemic. *Journal of Education for Teaching, 46*(4), 1-3.

Mukhlif, Z., & Amir, Z. (2017). Investigating the metacognitive online reading strategies employed by Iraqi EFL undergraduate students. *Arab World English Journal, 8*(1), 372-385.

O’Malley, J. M., & Chamot, A. U. (1990). *Learning strategies in second language acquisition*. Cambridge University Press.

Omar, N. A. (2014). Online metacognitive reading strategies use by postgraduate Libyan EFL students. *Engineering and Technology International Journal of Social, Behavioral, Educational, Economic, Business and Industrial Engineering, 8*(7), 2281-2284.

Oxford, R. (1990). *Language learning strategies: What every teacher should know*. Heinle & Heinle Publishers.

Phakiti, A. (2008). Strategic competence as a fourth-order factor model: A structural equation modeling approach. *Language Assessment Quarterly, 5*(1), 20-42.

Pookcharoen, S. (2009). *Metacognitive online reading strategies among Thai EFL university students* [Unpublished doctoral dissertation]. Indiana University.

Ramli, N. M., Darus, S., & Bakar, N. A. (2011). Metacognitive online reading strategies of adult ESL learners using a Learning Management System. *Theory and Practice in Language Studies, 1*(3), 195-204.

Rianto, A. (2020). Blended learning application in higher education: EFL learners’ perceptions, problems, and suggestions. *Indonesian Journal of English Language Teaching and Applied Linguistics, 5*(1), 55-68.

Sheorey, R., & Mokhtari, K. (2001). Differences in the metacognitive awareness of reading strategies among native and non-native readers. *System, 29*(4), 431-449.

Taki, S. (2016). Metacognitive online reading strategy use: Readers’ perceptions in L1 and L2. *Journal of Research in Reading, 39*(4), 409-427.

Taki, S., & Soleimani, G. H. (2012). Online reading strategy use and gender differences: The case of Iranian EFL learners. *Mediterranean Journal of Social Sciences, 3*(2), 173-184.

Vandergrift, L. (2002). “It was nice to see that our predictions were right”: Developing metacognition in L2 listening comprehension. *Canadian Modern Language Review, 58*(4), 555-575.

Velavan, T. P., & Meyer, C. G. (2020). The COVID-19 epidemic. *Tropical Medicine and International Health, 25*(3), 278-280.

Wu, J. Y. (2014). Gender differences in online reading engagement, metacognitive strategies, navigation skills and reading literacy. *Journal of Computer Assisted Learning, 30*(3), 252-271.

Zenotz, V. (2012). Awareness development for online reading. *Language Awareness, 21*(1-2), 85-100.
APPENDIX

Online Survey of Reading Strategies
Adapted from Anderson (2003) and Pookcharoen (2009)

The purpose of this survey is to collect information about the various strategies you use when you read online in English (e.g., surfing the Internet, doing online research, etc.) before and during the Covid-19 Pandemic. Each statement is followed by five numbers, 1, 2, 3, 4, and 5, and each number means the following:
‘1’ means that ‘I never or almost never do this’ when I read online.
‘2’ means that ‘I do this only occasionally’ when I read online.
‘3’ means that ‘I sometimes do this’ when I read online (About 50% of the time.)
‘4’ means that ‘I usually do this’ when I read online.
‘5’ means that ‘I always or almost always do this’ when I read online.

After reading each statement, click the number (1, 2, 3, 4, or 5) which applies to you.
Note that there are no right or wrong responses to any of the items on this survey.

Table A1. Global reading strategies.

| Global reading strategies                                                                 | 1 | 2 | 3 | 4 | 5 |
|------------------------------------------------------------------------------------------|---|---|---|---|---|
| Before the Covid-19 Pandemic, I had a purpose in mind when I read online.                 | 1 | 2 | 3 | 4 | 5 |
| During the Covid-19 Pandemic, I had a purpose in mind when I read online.                 | 1 | 2 | 3 | 4 | 5 |
| Before the Covid-19 Pandemic, I participated in live chat with other learners of English. | 1 | 2 | 3 | 4 | 5 |
| During the Covid-19 Pandemic, I participated in live chat with other learners of English. | 1 | 2 | 3 | 4 | 5 |
| Before the Covid-19 Pandemic, I participated in live chat with native speakers of English.| 1 | 2 | 3 | 4 | 5 |
| During the Covid-19 Pandemic, I participated in live chat with native speakers of English.| 1 | 2 | 3 | 4 | 5 |
| Before the Covid-19 Pandemic, I thought about what I already knew to help me understand what I read online. | 1 | 2 | 3 | 4 | 5 |
| During the Covid-19 Pandemic, I thought about what I already knew to help me understand what I read online. | 1 | 2 | 3 | 4 | 5 |
| Before the Covid-19 Pandemic, I first scrolled through the online text to see what it was about before reading it. | 1 | 2 | 3 | 4 | 5 |
| During the Covid-19 Pandemic, I first scrolled through the online text to see what it was about before reading it. | 1 | 2 | 3 | 4 | 5 |
| Before the Covid-19 Pandemic, I analyzed whether the content of the online text fitted my reading purpose. | 1 | 2 | 3 | 4 | 5 |
| During the Covid-19 Pandemic, I analyzed whether the content of the online text fitted my reading purpose. | 1 | 2 | 3 | 4 | 5 |
| Before the Covid-19 Pandemic, I reviewed the online text first by noting its characteristics like length and organization. | 1 | 2 | 3 | 4 | 5 |
| During the Covid-19 Pandemic, I reviewed the online text first by noting its characteristics like length and organization. | 1 | 2 | 3 | 4 | 5 |
| Before the Covid-19 Pandemic, when reading online, I decided what to read closely and what to ignore. | 1 | 2 | 3 | 4 | 5 |
| During the Covid-19 Pandemic, when reading online, I decided what to read closely and what to ignore. | 1 | 2 | 3 | 4 | 5 |
| Before the Covid-19 Pandemic, when academic sites had links to other sites, I clicked on them to see what they were. | 1 | 2 | 3 | 4 | 5 |
Table A1 continued...

|   | During the Covid-19 Pandemic, when academic sites had links to other sites, I clicked on them to see what they were. | 1 2 3 4 5 |
|---|-----------------------------------------------------------------------------------------------------------|----------|
| 10 | Before the Covid-19 Pandemic, I used tables, figures, and pictures in the online text to increase my understanding. | 1 2 3 4 5 |
|   | During the Covid-19 Pandemic, I used tables, figures, and pictures in the online text to increase my understanding. | 1 2 3 4 5 |
| 11 | Before the Covid-19 Pandemic, I used context clues to help me better understand what I was reading online. | 1 2 3 4 5 |
|   | During the Covid-19 Pandemic, I used context clues to help me better understand what I was reading online. | 1 2 3 4 5 |
| 12 | Before the Covid-19 Pandemic, I used typographical features like boldface and italics to identify key information. | 1 2 3 4 5 |
|   | During the Covid-19 Pandemic, I used typographical features like boldface and italics to identify key information. | 1 2 3 4 5 |
| 13 | Before the Covid-19 Pandemic, I critically analyzed and evaluated the information presented in the online text. | 1 2 3 4 5 |
|   | During the Covid-19 Pandemic, I critically analyzed and evaluated the information presented in the online text. | 1 2 3 4 5 |
| 14 | Before the Covid-19 Pandemic, I checked my understanding when I came across new information. | 1 2 3 4 5 |
|   | During the Covid-19 Pandemic, I checked my understanding when I came across new information. | 1 2 3 4 5 |
| 15 | Before the Covid-19 Pandemic, I tried to guess what the content of the online text was about when I read. | 1 2 3 4 5 |
|   | During the Covid-19 Pandemic, I tried to guess what the content of the online text was about when I read. | 1 2 3 4 5 |
| 16 | Before the Covid-19 Pandemic, I checked to see if my guesses about the online text were right or wrong. | 1 2 3 4 5 |
|   | During the Covid-19 Pandemic, I checked to see if my guesses about the online text were right or wrong. | 1 2 3 4 5 |
| 17 | Before the Covid-19 Pandemic, I scanned the online text to get a basic idea of whether it would serve my purposes before choosing to read it. | 1 2 3 4 5 |
|   | During the Covid-19 Pandemic, I scanned the online text to get a basic idea of whether it would serve my purposes before choosing to read it. | 1 2 3 4 5 |

Table A2. Problem solving strategies.

|   | Problem solving strategies |
|---|----------------------------|
| 1 | Before the Covid-19 Pandemic, I read slowly and carefully to make sure I understood what I was reading online. | 1 2 3 4 5 |
|   | During the Covid-19 Pandemic, I read slowly and carefully to make sure I understood what I was reading online. | 1 2 3 4 5 |
| 2 | Before the Covid-19 Pandemic, I tried to get back on track when I lost concentration. | 1 2 3 4 5 |
|   | During the Covid-19 Pandemic, I tried to get back on track when I lost concentration. | 1 2 3 4 5 |
| 3 | Before the Covid-19 Pandemic, I adjusted my reading speed according to what I was reading online. | 1 2 3 4 5 |
|   | During the Covid-19 Pandemic, I adjusted my reading speed according to what I was reading online. | 1 2 3 4 5 |
| 4 | Before the Covid-19 Pandemic, when online text became difficult, I paid closer attention to what I was reading. | 1 2 3 4 5 |
|   | During the Covid-19 Pandemic, when online text became difficult, I paid closer attention to what I was reading. | 1 2 3 4 5 |
Table A2 continued...

|   | Before the Covid-19 Pandemic, I stopped from time to time and thought about what I was reading online. |   |
|---|---------------------------------------------------------------------------------------------------|---|
|   | During the Covid-19 Pandemic, I stopped from time to time and thought about what I was reading online. |   |
| 5 | Before the Covid-19 Pandemic, I tried to picture or visualize information to help me remember what I read online. | 1 | 2 | 3 | 4 | 5 |
|   | During the Covid-19 Pandemic, I tried to picture or visualize information to help me remember what I read online. |   |
| 6 | Before the Covid-19 Pandemic, when the online text became difficult, I re-read it to increase my understanding. | 1 | 2 | 3 | 4 | 5 |
|   | During the Covid-19 Pandemic, when the online text became difficult, I re-read it to increase my understanding. |   |
| 7 | Before the Covid-19 Pandemic, when I read online, I guessed the meaning of unknown words or phrases. | 1 | 2 | 3 | 4 | 5 |
|   | During the Covid-19 Pandemic, when I read online, I guessed the meaning of unknown words or phrases. |   |
| 8 | Before the Covid-19 Pandemic, I skipped words or sections I found difficult or unfamiliar. | 1 | 2 | 3 | 4 | 5 |
|   | During the Covid-19 Pandemic, I skipped words or sections I found difficult or unfamiliar. |   |
| 9 | Before the Covid-19 Pandemic, I critically evaluated the online text before choosing to use the information I read online. | 1 | 2 | 3 | 4 | 5 |
|   | During the Covid-19 Pandemic, I critically evaluated the online text before choosing to use the information I read online. |   |
| 10| Before the Covid-19 Pandemic, I could distinguish between fact and opinion in online texts. | 1 | 2 | 3 | 4 | 5 |
|   | During the Covid-19 Pandemic, I could distinguish between fact and opinion in online texts. |   |
| 11| Before the Covid-19 Pandemic, when reading online, I looked for sites that cover both sides of an issue. | 1 | 2 | 3 | 4 | 5 |
|   | During the Covid-19 Pandemic, when reading online, I looked for sites that cover both sides of an issue. |   |
| 12| Before the Covid-19 Pandemic, I printed out a hard copy of the online text then underlined or circled information to help me remember it. | 1 | 2 | 3 | 4 | 5 |
|   | During the Covid-19 Pandemic, I printed out a hard copy of the online text then underlined or circled information to help me remember it. |   |

Table A3. Support strategies.

| Support strategies |
|--------------------|
| 1 | Before the Covid-19 Pandemic, I took notes while reading online to help me understand what I read. | 1 | 2 | 3 | 4 | 5 |
|   | During the Covid-19 Pandemic, I took notes while reading online to help me understand what I read. |   |
| 2 | Before the Covid-19 Pandemic, when the online text became difficult, I read aloud to help me understood what I read. | 1 | 2 | 3 | 4 | 5 |
|   | During the Covid-19 Pandemic, when the online text became difficult, I read aloud to help me understood what I read. |   |
| 3 | Before the Covid-19 Pandemic, I printed out a hard copy of the online text then underlined or circled information to help me remembered it. | 1 | 2 | 3 | 4 | 5 |
|   | During the Covid-19 Pandemic, I printed out a hard copy of the online text then underlined or circled information to help me remembered it. |   |
| 4 | Before the Covid-19 Pandemic, I used reference materials (e.g., an online dictionary) to help me understood what I read online. | 1 | 2 | 3 | 4 | 5 |
|   | During the Covid-19 Pandemic, I used reference materials (e.g., an online dictionary) to help me understood what I read online. |   |
| 5 | Before the Covid-19 Pandemic, I paraphrased (restate ideas in my own words) to better understood what I read online. | 1 | 2 | 3 | 4 | 5 |
During the Covid-19 Pandemic, I paraphrased (restate ideas in my own words) to better understood what I read online.

Before the Covid-19 Pandemic, I went back and forth in the online text to find relationships among ideas in it.

During the Covid-19 Pandemic, I went back and forth in the online text to find relationships among ideas in it.

Before the Covid-19 Pandemic, I asked myself questions I liked to have answered in the online text.

During the Covid-19 Pandemic, I asked myself questions I liked to have answered in the online text.

Before the Covid-19 Pandemic, when reading online, I translated from English into Indonesian.

During the Covid-19 Pandemic, when reading online, I translated from English into Indonesian.

Before the Covid-19 Pandemic, when reading online, I thought about information in both English and Indonesian.

During the Covid-19 Pandemic, when reading online, I thought about information in both English and Indonesian.

Before the Covid-19 Pandemic, When I encountered difficult reading in English, I sought material on the same topic in Indonesian.

During the Covid-19 Pandemic, When I encountered difficult reading in English, I sought material on the same topic in Indonesian.

Table A3 continued...

|   | During the Covid-19 Pandemic, I paraphrased (restate ideas in my own words) to better understood what I read online. | 1 2 3 4 5 |
|---|-------------------------------------------------------------------------------------------------------------|-----------|
| 6 | Before the Covid-19 Pandemic, I went back and forth in the online text to find relationships among ideas in it. | 1 2 3 4 5 |
|   | During the Covid-19 Pandemic, I went back and forth in the online text to find relationships among ideas in it. | 1 2 3 4 5 |
| 7 | Before the Covid-19 Pandemic, I asked myself questions I liked to have answered in the online text. | 1 2 3 4 5 |
|   | During the Covid-19 Pandemic, I asked myself questions I liked to have answered in the online text. | 1 2 3 4 5 |
| 8 | Before the Covid-19 Pandemic, when reading online, I translated from English into Indonesian. | 1 2 3 4 5 |
|   | During the Covid-19 Pandemic, when reading online, I translated from English into Indonesian. | 1 2 3 4 5 |
| 9 | Before the Covid-19 Pandemic, when reading online, I thought about information in both English and Indonesian. | 1 2 3 4 5 |
|   | During the Covid-19 Pandemic, when reading online, I thought about information in both English and Indonesian. | 1 2 3 4 5 |
| 10| Before the Covid-19 Pandemic, When I encountered difficult reading in English, I sought material on the same topic in Indonesian. | 1 2 3 4 5 |
|   | During the Covid-19 Pandemic, When I encountered difficult reading in English, I sought material on the same topic in Indonesian. | 1 2 3 4 5 |