# *"From bricks to Click":* Metacognitive Reading Skills of Students in the Pre and During Pandemic Era

Nafan Tarihoran[1], Evelyn Yanina Gallardo Lolandes[2], Aracelli del Carmen Gonzales Sánchez[3], Mitchell Alberto Alarcón Diaz[4], Dana Rad[5], Mohamed Aboobucker Mohamed Sameem[6], José Luis Arias Gonzales[7], Karina Concepción González Herrera[8], Joel Alanya-Beltran[9], Sabiroh Md Sabrie[10]

[1]State Islamic University, Sultan Maulana Hasanuddin Banten, Indonesia, nafan.tarihoran@uinbanten.ac.id
https://orcid.org/0000-0001-9637-5947
[2]Universidad César Vallejo, Perú, yanina.lolandes2803@gmail.com,https://orcid.org/0000-0003-4389-9514
[3]Universidad César Vallejo, Perú, dgonzalessa@gmail.com, https://orcid.org/0000-0003-0028-9177
[4]Universidad Nacional Mayor de San Marcos, Perú, malarcond@unmsm.edu.pe https://orcid.org/0000-0003-0027-5701
[5]Aurel Vlaicu University of Arad, Romania, dana@xhouse.ro, https://orcid.org/0000-0001-6754-3585
[6]South Eastern University of Sri Lanka, https://orcid.org/ : 0000-0002-5164-5277 Affiliation: Email:
risameem@seu.ac.lk
[7]Universidad Católica de Santa María (Perú)
https://orcid.org/ 0000-0002-3250-5287 Joseariasgon6@gmail.com
[8]Administration Division, Universidad Tecnologica Metropolitana, México
E-mail: karina.gonzalez@utmetropolitana.edu.mx
[9]Universidad Tecnológica del Perú,
Peru c18121@utp.edu.pe https://orcid.org/0000-0002-8058-6229
[10]Universiti Teknologi MARA, Cawangan Perlis, Kampus Arau, Perlis, Malaysia, sabir707@uitm.edu.my,
ORCID ID: 0000-0002-3838-0913

## Abstract

This paper addressed the emerging gap on the quality of reading instruction before and during the COVID 19 Pandemic onslaught. This study generally aimed to determine how EFL university students utilized metacognitive online reading methods before and after the Covid-19 outbreak. A study was conducted to investigate whether EFL university students' use of metacognitive reading methods had changed before and after the Covid-19 pandemic, and if so, what had changed. This study employed mixed-methods research utilizing quantitively and qualitative research designs. Testing the significant difference on the reading strategies of the students using t-test, the result revealed there is a significant difference on the reading strategies of the students. This indicates that during COVID 19 the students were able to attain a very high level of reading strategies compared during the pre-pandemic era which is attributed to the adoption of online learning where the mode of instruction is taken virtually and reading references among the students were mostly taken thru online access. On the qualitative context utilizing exploratory sequential design, revealed that EFL students were able to better their metacognitive online reading strategies during the COVID 19 as reflected in four themes: easier access of reading materials, flexibility of time and space, characteristics of e-books, and issues on the disruption of reading concentration brought by online reading activities. As a result, there is a perceived need to improve EFL students' metacognitive understanding of online reading techniques and help them become better online English readers. Helping students develop their metacognitive awareness of online reading methods and helping them master their metacognitive reading strategy usage are two approaches to help EFL students better comprehend online texts.

**Keywords:** EFL learners, reading skill, online, COVID 19, metacognitive, COVID 19

## 1. Introduction

The World Health Organization's Emergency Committee declared a global health emergency on January 30, 2020, due to an increase in the number of people contracting COVID 19 across the world (Ciotti, et al, 2020, Daniel, 2020, Pfefferbaum & North, 2020). This pandemic's reorganization of face-to-face learning activities and the need for only online learning are major effects on the education sector (Batubara, 2021). Most educational institutions worldwide have opted to conduct all learning activities completely online in an effort to limit the spread of this virus. Additionally, this new policy mandates that students and instructors complete learning activities at home, which has a negative effect on the social and intellectual development of those who participate (Chatziralli, et al, 2021, Iglesias-Pradas, et al, 2021, Lee, et al, 2021, Magulod, 2019). Most instructors and students will have new difficulties managing their learning activities when this educational strategy is implemented.

Numerous studies, both quantitative and qualitative, have been conducted on online learning (Anusudha & Krishnendu, 2021, Düzgün, 2021, Hasan, et al, 2021, Schwab-Reese, et al, 2020). Online language acquisition has only been studied in connection to contemporary epidemic circumstances in EFL and higher education contexts when metacognitive reading techniques are used in a few research. To be successful academically, EFL students must be proficient readers. When students can read well, their chances of succeeding in school improve (Bailey et al, 2021). Foreign language learners may study about a variety of subjects outside of the classroom in this online setting. When it comes to online reading methods, many studies have investigated how EFL students used metacognitive online reading strategies during the Covid-19 epidemic. Several metacognitive reading studies say that learning in a structured environment is important (Destianingsih & Satria, 2020, Muthuprasad, et al, 2021, Reimer, et al, 2021, Syahrin & Salih, 2020).

This research is focused on online language learning techniques. New technologies in the online learning environment have changed literacy in profound ways, according to researchers. Reading is defined as a problem-solving activity that incorporates new skills, techniques, and attitudes (Al-Ahdal & Alqasham, 2020, Al-Ahdal, 2020a, Al-Ahdal, 2020b, Al-Ahdal, 2020c, Heidari, 2020, Magulod Jr, 2018). According to Moghadam, et al, (2021), reading is an independent text production process that requires the use of metacognitive methods. The metacognitive techniques that go with reading abilities have been studied extensively. During reading, people engage in self-examination and self-regulation processes including making judgments about cognitive needs, according to Delgado and Samleron (2021). Moghadam et al (2021) have similar view, stating that these techniques are critical because they monitor, organize, and take the language learning process into account. Students that use these techniques have a better grasp of how to organize their learning, which increases their chances of success (Aharon, et al, 202, Dangin, 2020, Ferrara & Panlilio, 2020, Popandopulo, et al, 2021). Online reading assignments should require students to demonstrate metacognitive awareness by linking their techniques to their online goals. Metacognition is a predictor of reading comprehension ability because readers are aware of the strategies, they utilize to achieve their reading goals (Ferrara & Panlilio, 2020, Magulod 2018b).

Metacognitive online reading methods have been studied extensively in the last several decades (Abdelrahman, 2020, Anderson, 2002, Anderson, 2012, Kessler, 2021). There were no significant differences in the ways EFL and ESL students used global reading approaches and support methods, but EFL readers used problem-solving strategies more often than ESL readers. In order to better understand how EFL students used OSORS, other researchers tweaked it. Abenidi (2021) discovered that female students used more global online reading methods than male students, and that male students believed they were better readers online. There was no significant gender difference on electronic reading exams, but women performed better than men when it came to comprehending metacognitive methods as well as navigation skills and written reading tests. As shown by Kesici et al (2021) male and female students employed similar approaches

Nafan Tarihoran[1], Evelyn Yanina Gallardo Lolandes[2], Aracelli del Carmen Gonzales Sánchez[3], Mitchell Alberto Alarcón Diaz[4], Dana Rad[5], Mohamed Aboobucker Mohamed Sameem[6], José Luis Arias Gonzales[7], Karina Concepción González Herrera[8], Joel Alanya-Beltran[9], Sabiroh Md Sabrie[10]

overall, but their individual techniques differed significantly. Studies on the online reading methods were utilized in the same way by students with intermediate and advanced levels of English ability. The effect of reading methods on students' comprehension abilities was the focus of several research (Bulut, 2021, Can, 2021, Köse & Günes, 202, Wang, et al, 202). In a study comparing offline and online reading strategy training, Rapp and Mensink (2011) found that online readers performed better on overall reading comprehension than offline readers. Jung et al (2018) strategy training enhanced learners' online reading, but it had little impact on how they utilized strategies in their writing.

As time passed, it was anticipated that students would be able to understand more complex information. There was no study on Indonesian EFL students in any of the studies listed above. Findings from study on online reading techniques involving EFL students may have a significant impact on the country's English-language curriculum. Students and syllabus designers may use the results of this study in order to improve their understanding of metacognitive methods, which will help them meet their language learning goals.

## Research Objectives

This study generally aimed to determine how EFL university students utilized metacognitive online reading methods before and after the Covid-19 outbreak. A study was conducted to investigate whether EFL university students' use of metacognitive reading methods had changed before and after the Covid-19 pandemic, and if so, what had changed: (1) ascertain the EFL students metacognitive online reading techniques; (2) explore the meanings on the students online metacognitive reading strategies before and during COVID 19 pandemic.

## 2. Method

### 2.1. Research Design

The gathered data was evaluated using mixed methods research (MMR). The illuminating research setting is defined as a research technique that shows the combination of quantitative and qualitative designs. The quantitative part focused on the descriptive comparative of students metacognitive online reading skill while the qualitative part focused on the exploration of the latent experiences of students in online and offline reading. When the data were combined, the process of exploratory sequential design was observed. The MMR combine quantitative and qualitative data are particularly helpful when attempting to resolve discrepancies between them. Represents the views of those who participated. The use of a variety of techniques gives research participants a voice and ensures that study results are based on the experiences of study participants. Encourages collaboration among academics (Caruth, 2013)

### 2.2. Respondents and Ethical Consideration

The study participants for the quantitive part were the 88 sampled respondents in one University in Asia. There was a confidence level of 95% and a response distribution of 50% when using the Raosoft Sample Size Calculator to calculate the sample size, and participants from all grade levels were chosen via intentional sampling. Researchers in social sciences and linguistics may now utilize Raosoft as a sample size calculation with confidence. Researchers were able to utilize hypothesis testing using raosoft to evaluate whether or not a null hypothesis should be rejected in this investigation. As to the qualitative aspect, ten students were selected from the group for the Focus Group Discussion (FGD) in order to unearth their experiences on the problem of inquiry. Inclusion criteria of the informants were based on the those highest five students who have scored high in metacognitive reading and those five students who have scored lowest.

In terms of the study's ethical procedure, informed consent was utilized, and participants were provided with online orientation on the study's risks and benefits over the course of a two-day Zoom conference. Similarly, prior to beginning the research, appropriate coordination and securing the required permission were completed. Those who answered the survey under the age of 18 were asked to have their parents sign a permission form authorizing their participation in the study. Final preparations were made with the school and subject instructors so that the other subjects could

continue uninterrupted. The researcher performed a debriefing procedure through Google Meet at the conclusion of data collection. Participants were made aware that their responses and identities would be kept secret in order to conduct the research as fully as possible and Data Privacy Consent was acquired. The only way to identify the individuals in the story is to say that they are students. For the sake of avoiding plagiarism, the analyst will not express any strongly held opinions; only facts and conclusions based on the gathered data will be provided. This hypothesis has passed the Turnitin plagiarism check with a similarity index of not more than 20 percent

### 2.3. Instrumentation

Quantitative data for this study was gathered using the Online Survey of Reading Techniques (OSORS), which is based on the theory of online language learning techniques (Chen, 2015, Mudra, 2018, Taki, 2016). In all, there are 17 distinct approaches to each of the three categories: global strategies, problem-solving strategies, and assistance strategies (10 items. This study investigated the use of metacognitive online reading methods before and after the Covid-19 pandemic, and as a result, modifications were made to the instrument. The tool was subjected for validation by language experts and reliability test with Cronbach Alpha of 0.876. As to the qualitative part, the tool for the Focus Group Discussion (FGD) was an open-ended guide questions capturing the experiences of the students on the online and offline reading. Before the use of the tool, pilot tested was done for one week to a group not included in the study.

### 2.4. Data Gathering Protocol

To collect information for their study, the team used a survey questionnaire to the 88 students. Before the COVID 19, the researchers already conducted the survey to the students with the original research plan. On the onslaught of pandemic which becomes the pre-scores of the respondents, with the onslaught of pandemic, the researchers decided to carry out the study again to the respondents to get the during-scores. Necessary planning and meeting were done in order to carry out the redirection of the study's' research design. After a careful consideration, the team decided to employ the pre-test-post-test

design for the qualitative and to be supplement the findings with in-depth experiences, the use of FGD was carried out. Hence, necessary tracing of respondents was conducted. A panel of specialists, comprising the dean, expert consultants, an advisor, and a university statistician, evaluated and verified the questionnaire before it was made available to the general public. Sample selection procedures included contacting the Registrar's Office to obtain additional information about the study's participants. Purposive sampling was employed in this investigation by the researchers. Personnel involved in sampling were given questionnaires by the researcher after that. When the participants were gathered, Zoom Meeting was used to explain the study's objective and context to them. After then, data was gathered via using Google Forms, with survey participants answering questions on the form. Respondents were informed that their responses were private and confidential through a Data Privacy Consent form. After the findings were totalled, the data was examined.

### 2.5. Data Analysis

On the quantitative component, the following statistical methods were used to evaluate the quantitative data: A percent distribution was used to determine the demographics of the people who took the poll. On a Likert Scale, the following aspects were rated: To evaluate the use, the scale ranges from the least acceptable (1 point) to the most unacceptable (5 points). Using statistical software SPSS 23 version and an alpha level of 0.05, all of the study's data was further analyzed to assess its results. On the analysis of the FGD transcripts for the qualitative part, the researcher employed coding and thematic analysis of the recorded interviews. Two language teachers were requested to do the validation to avoid bias.

## 3. Results and Discussion

### Students' Before and During COVID 19 Metacognitive Online Reading Strategies

Table 1 shows the comparison of the pre and during COVID 19 metacognitive reading strategies of the students. It is clear in the table that during the pre-COVID pandemic, the students manifested a high level of online metacognitive reading strategies with the mean

Nafan Tarihoran[1], Evelyn Yanina Gallardo Lolandes[2], Aracelli del Carmen Gonzales Sánchez[3], Mitchell Alberto Alarcón Diaz[4], Dana Rad[5], Mohamed Aboobucker Mohamed Sameem[6], José Luis Arias Gonzales[7], Karina Concepción González Herrera[8], Joel Alanya-Beltran[9], Sabiroh Md Sabrie[10]

of 3.12 9 (sd=0.43) and during the COVID 19 the students have scored very high with the mean of 3.52 (sd=0.23). testing the significant difference on the reading strategies of the students using t-test, the result revealed that with the computed t value of 0.001 which is lower than the alpha level of 0.05, the data presents that there is a significant difference on the reading strategies of the students. This indicates that during COVID 19 the students were able to attain a very high level of reading strategies. This can be attributed to the adoption of online learning where the mode of instruction is taken virtually and reading references among the students were mostly taken thru online access.

Table 1. Pre and During COVID 19 Reading Strategies

| Reading Strategies | Mean | Interpretation | Standard Deviation | Standard Error of the Mean | Computed t-value |
|---|---|---|---|---|---|
| Pre-COVID | 3.123 | High | 0.43 | 1.11 | 0.001* |
| During COVID | 3.523 | Very High | 0.23 | 1.23 | |

Critical value *t (df=37) .05.2-tailed tests) =2.033*

**= significant at 0.01 level

EFL students were more likely to use assistance techniques in their online academic reading before to and during the Covid-19 outbreak. There was a strong correlation between the students' use of these strategies in both situations and their dependence on basic comprehension support mechanisms. To make sense of what they were reading on the internet, they turned to a variety of reference tools, such as dictionaries online. Prior to and after the Covid-19 outbreak, basic support mechanisms necessitated the use of English as the main language of communication. This finding justifies that the students find benefits on the online reading rather than offline reading which enhanced their metacognitive skills. Similar findings have shown that students are performing better in online language learning than offline (Elahi & Mashhadi Heidar, 2021, Lee & Pyo, 2003, Rienties, et al, 2018). Such finding would imply, that during the time when students were inside the brick walls of the university, they were already developing their metacognitive reading strategies, but during the COVID when the university shifted to online learning modality, they were able to enhanced their reading skills through the use of Computer Assisted Language Learning (CALL) at home. When it comes to the methods employed before the Covid-19 epidemic, this study's findings provide scientific evidence for novel literacy theory, particularly when used in a classroom setting. Reading is described as an investigation based on new abilities, methods, and dispositions in this theoretical framework. Metacognitive online reading methods in the setting of higher education and learning circumstances that are not typical because of the Covid-19 epidemic are also included to this study's results. Further study in this area revealed that during the epidemic, people used the techniques much more than they did before the outbreak. As online models become more widely used in educational institutions, the policy necessitates changes in teaching and learning methods. Findings like this add credence to the worldwide phenomena of online learning displacing face-to-face learning in educational settings because to the proliferation of Covid-19. Previous studies also showed that the usage of online reading methods was affected by variables such as reading strategy instructions, chances to apply strategies, and the quality of the internet network (Kiili, et al, 2018, Li, 2020, Loh & Sun, 2019, Soberano, 2017).

**Qualitative Responses of the Students**

Based on the qualitative responses of the students taken from FGD, it captured four themes of students' experiences on their

metacognitive reading skills. There were four themes emerged as pattern of reflections utilizing exploratory sequential design, revealed that EFL students were able to better their metacognitive online reading strategies during the COVID 19 as reflected in four themes: easier access of reading materials, flexibility of time and space, characteristics of e-books, and issues on the disruption of reading concentration brought by online reading activities. This finding justifies that the students find comfort in using technology as aid in developing their reading skills tis further justifies that the use of Computer Assisted Language Learning (CALL) improves students' language proficiency on reading (Syafryadin, et al, 2021, Cucchiarini, et al, 2021, Zhang, 2021).

## Easier Access of Reading Materials

In order to better understand how students really utilize online reading techniques, think-aloud sessions data were analyzed. Student A remarked "*Before COVID 19, we are already required to do reading in English as instructed by our teachers. We are given also required to go in the library to borrow books. But due to COVID, all our reading references are now accessed through online. And its easier for us to read now.*" From the response of the students, it is clear to note that they are now preferring to read online. In like manner, another student said *"Now that we are under COVID, I think I have better access now of the reading materials since our school already provided us the link where we can get reading materials like the EBSCOHOST.*" This finding suggest that the students are benefitting more on their metacognitive reading strategies due to the online access and availability of reading materials. Further, another student said "*Through online reading, I am easily updated with the trends of English language .*" This explains that the students are seeing the advantages of online reading.

## Flexibility of Time and Space

As to students' difficulties and challenges, Student C said *"Before COVID 19, it takes time for us to borrow books in the library. We line and it takes time for us to get the best reading material for our topic. Now, that online learning*

*and reading is encouraged in COVID 19 year, just a click of our finger we get the reading material we need.*" As seconded by the other student who said "*Our physical presence to borrow book is a requirement, now its just our student code and we get the e-book in one snap of our finger.*" From the findings, the adoption of e-learning in the pandemic year made students to regulate their reading skills. As stated in the digital age's e-learning methods for providing information, e-learning in education has the benefit of placing an emphasis on meeting the requirements of individual students as opposed to meeting the needs of instructors or educational institutions.

## Characteristics of E-books

Another theme emerged where metacognitive reading skills of students were enhanced during COVID 19 is the read aloud characterises of e-books. Student D said "*Since hyperlinks, translation services, and online dictionaries are readily available on the internet, internet reading has an encouraging comprehension level.*" Another student said "*Well, I think I benefit more during COVID 19 since there are features of my phone where I can just let be read aloud and listen to the reading materials. It makes me understood the topic.*" Further, one said "*Doing online searching made me develop higher level of reading comprehension.*". In like manner *one* said *"When I get information through online, my interest is on my reading involvement.*" Almost all of the students who answered the survey agreed that reading on the internet improves one's understanding. Any new word or subject that they need to learn will be easier for them to grasp if they have access to relevant information. Another feature is the inclusion of text-based hyperlinks. More information may be found by clicking on the hyperlinks, which aid in understanding the new terminology. Internet translation services may be used to translate reading materials that are in a foreign language. Every one of these things adds to the amount of knowledge available to fully comprehend the topic.

## Distraction of Reading Concentration

The degree of attention required for online reading is determined by the readers' level of interest. In terms of serious reading, it's at the very top of the heap. Concentration is improved

Nafan Tarihoran[1], Evelyn Yanina Gallardo Lolandes[2], Aracelli del Carmen Gonzales Sánchez[3], Mitchell Alberto Alarcón Diaz[4], Dana Rad[5], Mohamed Aboobucker Mohamed Sameem[6], José Luis Arias Gonzales[7], Karina Concepción González Herrera[8], Joel Alanya-Beltran[9], Sabiroh Md Sabrie[10]

by having access to the most recent and most current information. However, not all, but the majority of those polled said that reading printed material heightened their level of focus compared to internet reading. When people read on the internet, it seemed that advertisements and hyperlinks were detracting from their focus. They are unable to read for long periods of time on smart phones and PC displays due to the glare from their beams. One student said *"I can focus on online reading for up to an hour and a half."* Another one said "Advertising and other links distract my attention while I read on the internet, so I have to make an effort to concentrate." One further said "This *is now the pitfall of online reading compared to reading of physical books. There are many distractions especially when my phone or tablet are connected to fb messenger. If I find a study paper online, I must print it out since printed reading requires a greater degree of attention than online reading, which I learned as a student*."

The qualitative responses showed that students find benefits on the use of online reading which enhanced their metacognitive reading skills. For the students, Internet reading is a pleasant experience due to the convenience with which information can be accessed at home, work, and on the road. Digital media is altering people's reading habits (Bahari, 2021, Nasri, et al, 2021). When it comes to reading for fun, the participant prefers paper, but for work, they choose the internet. In addition, a number of people said they had a difficult time reading online because of tiredness and eye strain. Because of the vast amount of material available on the internet, it takes time to get through it all while reading online. Students are more likely to read because of the abundance of freely available and quickly accessible material that can be found on the Internet. Cross-referencing and linking to other links enhanced the quality of the material as well as using hyperlinks. Having a smart phone may have a major effect on the development of a reading habit in those who use it. Phones with cameras (Chong & Reinders, 2021, Iterbeke, et al, 2021, Klimova, 2021, Tang, 2021). On-line content is enhanced by the inclusion of visual aids like graphs, images and color schemes. In order to fulfill professional and personal information requirements, having easy access to the internet is essential, both at work and at home. Expertise is being developed while professional and non-professional needs are

being fulfilled. By offering online lectures, tutorials, and demos, it also aids users in improving their capacity to study independently. The internet enhances people's understanding since it makes the whole world's information readily accessible to them.

## 4. Conclusions

This study generally aimed to determine how EFL university students utilized metacognitive online reading methods before and after the Covid-19 outbreak. A study was conducted to investigate whether EFL university students' use of metacognitive reading methods had changed before and after the Covid-19 pandemic, and if so, what had changed. This study employed mixed-methods research utilizing quantitively and qualitative research designs. Testing the significant difference on the reading strategies of the students using t-test, the result revealed there is a significant difference on the reading strategies of the students. This indicates that during COVID 19 the students were able to attain a very high level of reading strategies compared during the pre-pandemic era which is attributed to the adoption of online learning where the mode of instruction is taken virtually and reading references among the students were mostly taken thru online access. On the qualitative context utilizing exploratory sequential design, revealed that EFL students were able to better their metacognitive online reading strategies during the COVID 19 as reflected in four themes: easier access of reading materials, flexibility of time and space, characteristics of e-books, and issues on the disruption of reading concentration brought by online reading activities. As a result, there is a perceived need to improve EFL students' metacognitive understanding of online reading techniques and help them become better online English readers. Helping students develop their metacognitive awareness of online reading methods and helping them master their metacognitive reading strategy usage are two approaches to help EFL students better comprehend online texts.

## 5. Recommendations and Implications

As a consequence of the findings, it seems that EFL students must retain and enhance their CT

abilities, such as analytical skills, in order to better use their metacognitive reading strategies in an online setting. Educators in the L2 should pay attention to variables such as creativity and teaching/learning styles that contribute to the analytical and critical thinking abilities of EFL students and create documents that incorporate far more thinking skills into instructional resources like textbooks. Furthermore, the findings showed a modest but significant link between CT and the adoption of metacognitive strategies when reading online. So it follows that in the classroom, L2 instructors need to foster learning settings where metacognition and CT abilities like problem-solving and analysis are emphasized.

## 6. Limitations and Future Directions

Finally, the results should be seen within the context of the study's limitations. The current research used self-report measures and interview to collect data from a small group of participants on the usage of metacognitive online reading strategies and CT. Some reading techniques, however, were impossible to monitor due to the intricacy of ideas, processes, and behaviors. To get more information on the factors above, researchers may do further study using different techniques like interviews with a bigger sample and other kinds of sampling. In addition, this research used a homogeneous sample and excluded EFL students with English skill levels below or equal to intermediate. Research on metacognitive online reading strategy usage and CT may take L2 readers' different skill levels, as well as factors like gender, into consideration in the future.

## References

[1] Abdelrahman, R. M. (2020). Metacognitive awareness and academic motivation and their impact on academic achievement of Ajman University students. *Heliyon*, *6*(9), e04192.

[2] Abedini, Y. (2021). Metacognition as a core skill for wise decision-making in higher education: investigating gender differences. *Journal of Applied Research in Higher Education.*

[3] Aharon, A. A., Ruban, A., & Dubovi, I. (2021). Knowledge and information credibility evaluation strategies regarding COVID-19: A cross-sectional study. *Nursing Outlook*, *69*(1), 22-31.

[4] Al-Ahdal, A. A. M. H. & Alqasham, F. H. (2020). Saudi EFL Learning and Assessment in Times of Covid-19: Crisis and beyond. *Asian EFL Journal*, 28 (1.1), 356-383.

[5] Al-Ahdal, A. A. M. H. (2020a). Overcoming Pronunciation Hurdles in EFL Settings: An Evaluation of Podcasts as a Learning Tool at Qassim University Saudi Arabia. *Asian EFL Journal Research Articles*, 27-35.

[6] Al-Ahdal, A. A. M. H. (2020b). Translanguagism and the Bilingual EFL Learner of Saudi Arabia: Exploring New Vistas. *Asian EFL Journal*, *27*(1), 14-26.

[7] Anderson, N. J. (2002). The Role of Metacognition in Second Language Teaching and Learning. ERIC Digest.

[8] Anderson, N. J. (2012). Metacognition: Awareness of language learning. In *Psychology for language learning* (pp. 169-187). Palgrave Macmillan, London.

[9] Anusudha, R. S., & Krishnendu, R. (2021). Education at the Crossroads: Digitalization of Education in India During an Age of Pandemic. *Psychology and Education Journal*, *58*(3), 1469-1479.

[10] Bahari, A. (2021). Computer-assisted language proficiency assessment tools and strategies. *Open Learning: The Journal of Open, Distance and e-Learning*, *36*(1), 61-87.

[11] Bailey, D., Almusharraf, N., & Hatcher, R. (2021). Finding satisfaction: intrinsic motivation for synchronous and asynchronous communication in the online language learning context. *Education and Information Technologies*, *26*(3), 2563-2583.

[12] Batubara, B. M. (2021). The Problems of the World of Education in the Middle of the Covid-19 Pandemic. *Budapest International Research and Critics Institute (BIRCI-Journal): Humanities and Social Sciences*, *4*(1), 450-457.

[13] Bulut, A. S. An Empirical Investigation of Mathematics Learning Approaches and Metacognitive Awareness of Students. *Participatory Educational Research*, *8*(4), 84-102.

Nafan Tarihoran[1], Evelyn Yanina Gallardo Lolandes[2], Aracelli del Carmen Gonzales Sánchez[3], Mitchell Alberto Alarcón Diaz[4], Dana Rad[5], Mohamed Aboobucker Mohamed Sameem[6], José Luis Arias Gonzales[7], Karina Concepción González Herrera[8], Joel Alanya-Beltran[9], Sabiroh Md Sabrie[10]

[14] Can, F. (2021). Examining the Relationship between Turkish Teacher Candidates' Metacognitive Learning Strategies and Critical Listening Attitudes. *Shanlax International Journal of Education*, 9, 145-153.

[15] Caruth, G. D. (2013). Demystifying mixed methods research design: A review of the literature. *Online Submission*, 3(2), 112-122.

[16] Chatziralli, I., Ventura, C. V., Touhami, S., Reynolds, R., Nassisi, M., Weinberg, T., ... & Loewenstein, A. (2021). Transforming ophthalmic education into virtual learning during COVID-19 pandemic: a global perspective. *Eye*, 35(5), 1459-1466.

[17] Chen, L. W. C. (2015). Taiwanese EFL Learners' Perceived Use of Online Reading Strategies. *IAFOR Journal of Education*, 3(2), 68-80.

[18] Chong, S. W., & Reinders, H. (2021). A methodological review of qualitative research syntheses in CALL: The state-of-the-art. *System*, 103, 102646.

[19] Ciotti, M., Ciccozzi, M., Terrinoni, A., Jiang, W. C., Wang, C. B., & Bernardini, S. (2020). The COVID-19 pandemic. *Critical reviews in clinical laboratory sciences*, 57(6), 365-388

[20] Cucchiarini, C., Hubers, F., & Strik, H. (2021). Learning L2 idioms in a CALL environment: the role of practice intensity, modality, and idiom properties. *Computer Assisted Language Learning*, 1-29.

[21] Dangin, D. (2020). Students' Awareness of Metacognitive Reading Strategies in Academic Reading. *Journal of English Teaching and Learning Issues*, 3(1), 33-42.

[22] Daniel, J. (2020). Education and the COVID-19 pandemic. *Prospects*, 49(1), 91-96.

[23] Delgado, P., & Salmerón, L. (2021). The inattentive on-screen reading: Reading medium affects attention and reading comprehension under time pressure. *Learning and instruction*, 71, 101396.

[24] Destianingsih, A., & Satria, A. (2020). Investigating students' needs for effective English online learning during Covid-19 for Polbeng students. *ELT-Lectura*, 7(2), 147-153.

[25] Düzgün, S. (2021). Teachers' Attitudes toward Turkey Education Informatics Network during the Distance Education Period in the Covid-19 Pandemic. *International Journal of Progressive Education*, 17(5).

[26] Elahi, A., & Mashhadi Heidar, D. (2021). The Impact of Integrating Blended Learning with Task-Based Language Learning on Reading Comprehension of Iranian EFL Learners. *Journal of Language Horizons*, 5(1), 6-6.

[27] Ferrara, A. M., & Panlilio, C. C. (2020). The role of metacognition in explaining the relationship between early adversity and reading comprehension. *Children and Youth Services Review*, 112, 104884.

[28] Ferrara, A. M., & Panlilio, C. C. (2020). The role of metacognition in explaining the relationship between early adversity and reading comprehension. *Children and Youth Services Review*, 112, 104884.

[29] Hasan, M. R., Kalikiri, M. K., Mirza, F., Sundararaju, S., Sharma, A., Xaba, T., ... & in Qatar, E. (2021). Real-time SARS-CoV-2 genotyping by high-throughput multiplex PCR reveals the epidemiology of the variants of concern in Qatar. *International Journal of Infectious Diseases*.

[30] Heidari, K. (2020). Critical thinking and EFL learners' performance on textually-explicit, textually-implicit, and script-based reading items. *Thinking Skills and Creativity*, 37, 100703.

[31] Iglesias-Pradas, Santiago, et al. "Emergency remote teaching and students' academic performance in higher education during the COVID-19 pandemic: A case study." *Computers in Human Behavior* 119 (2021): 106713.

[32] Iterbeke, K., De Witte, K., & Schelfhout, W. (2021). The effects of computer-assisted adaptive instruction and elaborated feedback on learning outcomes. A randomized control trial. *Computers in Human Behavior*, 120, 106666.

[33] Jung, C., Kang, J., Mohaisen, A., & Nyang, D. (2018, April). Digitalseal: a transaction authentication tool for online and offline transactions. In *2018 IEEE International Conference on Acoustics,*

*Speech and Signal Processing (ICASSP)* (pp. 6956-6960). IEEE.

[34] Kesici, A. E., Güvercin, D., & Küçükakça, H. (2021). Metacognition Researches in Turkey, Japan and Singapore. *International Journal of Evaluation and Research in Education*, *10*(2), 535-544.

[35] Kessler, Matt. "The longitudinal development of second language writers' metacognitive genre awareness." *Journal of Second Language Writing* 53 (2021): 100832.

[36] Kiili, C., Leu, D. J., Marttunen, M., Hautala, J., & Leppänen, P. H. (2018). Exploring early adolescents' evaluation of academic and commercial online resources related to health. *Reading and writing*, *31*(3), 533-557.

[37] Klimova, B. (2021). Use of Virtual Reality in Non-Native Language Learning and Teaching. *Procedia Computer Science*, *192*, 1385-1392.

[38] Köse, N., & Günes, F. (2021). Undergraduate Students' Use of Metacognitive Strategies While Reading and the Relationship between Strategy Use and Reading Comprehension Skills. *Journal of Education and Learning*, *10*(2), 99-108.

[39] Lee, C. H., & Pyo, K. H. (2003). A study on the effectiveness of online/offline English language learning at university level. *Multimedia-Assisted Language Learning*, *6*(1), 90-110.

[40] Lee, S. J., Ward, K. P., Chang, O. D., & Downing, K. M. (2021). Parenting activities and the transition to home-based education during the COVID-19 pandemic. *Children and Youth Services Review*, *122*, 105585.

[41] Li, J. (2020). Development and validation of second language online reading strategies inventory. *Computers & Education*, *145*, 103733.

[42] Loh, C. E., & Sun, B. (2019). "I'd Still Prefer to Read the Hard Copy": Adolescents' Print and Digital Reading Habits. *Journal of Adolescent & Adult Literacy*, *62*(6), 663-672.

[43] Magulod Jr, G. C. (2018a). Innovative learning tasks in enhancing the literary appreciation skills of students. *SAGE Open*, *8*(4), 2158244018820382.

[44] Magulod Jr, G. C. (2018b). Cognitive and Attitudinal Effects of Movie Poster Making Method in College Classroom. *Journal of Educational and Human Resource Development*, *6*, 42-58.

[45] Magulod Jr, G. C. (2019). Learning Styles, Study Habits and Academic Performance of Filipino University Students in Applied Science Courses: Implications for Instruction. *Journal of Technology and Science Education*, *9*(2), 184-198.

[46] Moghadam, Z. B., Narafshan, M. H., & Tajadini, M. (2021). Development of a critical self in the language reading classroom: An examination of learners' L2 self. *Thinking Skills and Creativity*, *42*, 100944.

[47] Moghadam, Z. B., Narafshan, M. H., & Tajadini, M. (2021). Development of a critical self in the language reading classroom: An examination of learners' L2 self. *Thinking Skills and Creativity*, *42*, 100944.

[48] Mudra, H. (2018). Metacognitive online reading strategies among pre-service EFL teachers in Indonesia. *Educational Process: International Journal (EDUPIJ)*, *7*(2), 151-164.

[49] Muthuprasad, T., Aiswarya, S., Aditya, K. S., & Jha, G. K. (2021). Students' perception and preference for online education in India during COVID-19 pandemic. *Social Sciences & Humanities Open*, *3*(1), 100101.

[50] Nasri, M., Shafiee, S., & Sepehri, M. (2021). An Investigation of Iranian Intermediate EFL Learners' L2 Motivation and Attitude in a Computer-Assisted Language Learning Environment. *Issues in Language Teaching*, *10*(1), 355-389.

[51] Pfefferbaum, B., & North, C. S. (2020). Mental health and the Covid-19 pandemic. *New England Journal of Medicine*, *383*(6), 510-512.

[52] Popandopulo, A., Fominykh, N., & Kudysheva, A. (2021). Do Educators Need Metacognitive Skills in Today's Educational Environment?. *Thinking Skills and Creativity*, 100878.

[53] Rapp, D. N., & Mensink, M. C. (2011). Focusing effects from online and offline reading tasks.

Nafan Tarihoran[1], Evelyn Yanina Gallardo Lolandes[2], Aracelli del Carmen Gonzales Sánchez[3], Mitchell Alberto Alarcón Diaz[4], Dana Rad[5], Mohamed Aboobucker Mohamed Sameem[6], José Luis Arias Gonzales[7], Karina Concepción González Herrera[8], Joel Alanya-Beltran[9], Sabiroh Md Sabrie[10]

[54] Reimer, D., Smith, E., Andersen, I. G., & Sortkær, B. (2021). What happens when schools shut down? Investigating inequality in students' reading behavior during Covid-19 in Denmark. *Research in Social Stratification and Mobility*, *71*, 100568.

[55] Rienties, B., Lewis, T., McFarlane, R., Nguyen, Q., & Toetenel, L. (2018). Analytics in online and offline language learning environments: the role of learning design to understand student online engagement. *Computer Assisted Language Learning*, *31*(3), 273-293.

[56] Schwab-Reese, L. M., Drury, I., Allan, H., & Matz, K. (2020). " Oh, this is actually okay": Understanding how one state child welfare training system adapted to the COVID-19 pandemic. *Child Abuse & Neglect*, *110*, 104697.

[57] Soberano, C. G. (2017, November). Online and Offline Reading Comprehension. In *Ascendens Asia Journal of Multidisciplinary Research Conference Proceedings* (Vol. 1, No. 2).

[58] Syafryadin, Syafryadin, Veronika Unun Pratiwi, and Dian Eka Chandra Wardhana. "Pre-service English teachers' experience with various CALL applications: Hindrances and reflection." *Studies in English Language and Education* 8.1 (2021): 99-114.

[59] Syahrin, S., & Salih, A. A. (2020). An ESL Online Classroom Experience in Oman during Covid-19. *Arab World English Journal*, *11*(3), 42-55.

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

[61] Tang, K. Y. (2021). Paradigm shifts in e-book-supported learning: Evidence from the Web of Science using a co-citation network analysis with an education focus (2010–2019). *Computers & Education*, *175*, 104323.

[62] Wang, F., Leung, S. O., & Jiang, C. (2021). Psychometric Properties of Cognitive and Metacognitive Learning Strategies Scale Among Chinese Senior Secondary School Students. *Journal of Psychoeducational Assessment*, 07342829211011806.

[63] Zhang, Q. (2021). A Literature Review of Foreign Studies on the Impact of CALL on Second Language Acquisition from 2015. *English Language Teaching*, *14*(6), 76-83.