

# COGNITIVE ENGAGEMENT DURING EMERGENCY REMOTE TEACHING: HOW STUDENTS STRUGGLE

## [KETERLIBATAN KOGNITIF DALAM LINGKUNGAN PENGAJARAN DARURAT: BAGAIMANA PERJUANGAN SISWA]

Audi Yundayani<sup>1</sup>, Fiki Alghadari<sup>2</sup>

STKIP Kusuma Negara<sup>1,2</sup>

[audi\\_yundayani@stkipkusumanegara.ac.id](mailto:audi_yundayani@stkipkusumanegara.ac.id)<sup>1</sup>,

[fiki\\_alghadari@stkipkusumanegara.ac.id](mailto:fiki_alghadari@stkipkusumanegara.ac.id)<sup>2</sup>

### Abstract

COVID-19 pandemic situation affects the higher education system in Indonesia. It creates an ecosystem of online learning to enact an essential role in students' cognitive engagement. This qualitative research utilized multimodal data collection to examine students' voices to assess how they perceived the cognitive engagement dimension in the emergency remote teaching (ERT) phenomenon. Data were gathered from 60 students from three higher education institutions in Indonesia's urban areas. The findings reveal that the ERT environment requires students to self-regulate their learning by employing their preferred strategies to comprehend the material. Moreover, they engage in meaningful learning by relating the content to their prior experiences and knowledge. Students believe teachers are vital in ERT as authoritative figures and focal learning points. They viewed teachers as the most crucial agents for fostering and enhancing their cognitive engagement. This study draws more attention to the need for continuous teacher professional development in ERT by concentrating on students' needs.

**Keywords:** Cognitive engagement; Emergency remote teaching; Online learning.

### **Abstrak**

Situasi pandemi COVID-19 berdampak pada sistem pendidikan tinggi di Indonesia. Ini menciptakan ekosistem pembelajaran online untuk memberlakukan peran penting keterlibatan kognitif oleh siswa. Penelitian kualitatif ini menggunakan pengumpulan data multimodal untuk memeriksa suara siswa untuk menilai bagaimana mereka merasakan dimensi keterlibatan kognitif dalam fenomena pengajaran jarak jauh darurat. Data dari 60 mahasiswa dari tiga perguruan tinggi yang berada di perkotaan Indonesia. Hasil penelitian menunjukkan bahwa pengaturan pengajaran darurat mengharuskan siswa untuk menerapkan proses belajar mandiri dengan mengatur preferensi metode pembelajaran mereka untuk memahami isi materi. Bahkan, mereka melakukan pembelajaran yang bermakna dengan menghubungkan konten dengan pengalaman dan pengetahuan mereka sebelumnya. Mereka juga percaya bahwa guru, serta siswa, memainkan peran penting dalam lingkungan pengajaran darurat. Selain itu, karena keyakinan mereka bahwa guru masih menjadi pusat pembelajaran sebagai sosok otoriter, mereka menggambarkan guru sebagai agen utama untuk mempromosikan dan meningkatkan keterlibatan kognitif mereka. Studi ini lebih menarik perhatian pada perlunya pengembangan profesional guru yang berkelanjutan dalam situasi pengajaran darurat dengan berkonsentrasi pada kebutuhan siswa.

**Kata Kunci:** Keterlibatan kognitif; Pembelajaran online; Pengajaran jarak jauh darurat.

### **Introduction**

The Coronavirus Pandemic of 2019 (COVID-19) had such a huge effect on the higher education sector in Indonesia (Jakarta Globe, 2020). Policy on home study published by the Indonesian government to stop the spread of Coronavirus. Thus, emergency remote teaching (ERT) is deployed alongside online learning (Universitas Katholik Atma Jaya, 2020; Wardana & Hasul, 2020). This requires both teachers and students to be able and eager to use any attainable interactive platform for online

learning, including synchronous and asynchronous interactions. They are engaged in a trial-and-error process to figure out how best to implement the online learning model, resulting in a possible short-term interruption to the learning process.

In the context of the ERT climate, Indonesia's higher education institutions have shown persistent concern about meeting the academic standards required through the use of emerging technologies that offer new ways of learning. This circumstance requires students to experience and rely on the remote learning environment. Engagement is linked to students' continued involvement in educationally-oriented activities and corresponds with their desired academic outcomes (Fredricks & McColskey, 2012). Prior research has indicated that student engagement in online learning is crucial for achieving learning objectives (Bergdahl, Nouri, & Fors, 2020; Muir et al., 2019). This has a key role to play in the online learning process. It can be seen as the pillar of the battle against low-performance problems and high levels of student boredom. It may also lead to sustainable educational practices, which further contribute to comprehensive learning.

Recognizing higher education students as digital natives means that they are familiar with computer technology, so we are curious to know how Indonesian students are engaged in the cognitive aspect of online learning in the current ERT situation. It seems daunting due to the online learning environment of the ERT has not been popularly established in all Indonesian universities. In fact, the new ERT scenario requires both teachers and students to be able to learn online with all the disadvantages of training, expertise, and technology support.

Studies (e.g. Nasir & Iqbal, 2019; Peng & Kievit, 2020; Wong et al., 2019) believe that cognitive performance plays a significant role in determining academic success for students. Greene (2015) described cognitive engagement as the employment of cognitive strategy type and degree, self-regulatory processes, and the amount of effort required. This generally refers to the application of learning strategies, which indicates that students comprehend and manage cognitive learning activities and that numerous learning mechanisms can contribute to various levels of cognition (Hu & Li, 2017). This highlights how students can deal with acquiring knowledge through their learning strategies and predict their progress by concentrating on what has been taught and how to gain more

effectively. Understanding that students are engaging in online learning is a significant topic for research in this new ERT setting. Although researchers have several viewpoints on online learning students, there needs to be more work examining student voices to determine how ERT events were perceived regarding their cognitive involvement. Hence, the purpose of this study was to investigate student voices in order to uncover how they viewed the cognitive engagement aspect of the ERT phenomena.

## Research method

This research uses a qualitative perspective. This study is conducted by using multimodal data collection through semi-structured interviews and questionnaires involving 60 students from three higher education institutions located in urban areas of Indonesia. A multimodal data collection is to examine students' voices in order to assess how they perceived the cognitive engagement dimension in the ERT phenomenon.

Triangular data analysis was performed on the basis of metrics for each aspect of cognitive engagement. The main findings are reviewed and explored. This paper begins with a brief introduction and continues to be discussed and concluded. The research presented here focused solely on the cognitive engagement of students in online learning during the ERT era.

## Research results

The results of the study were taken from the survey questionnaire and interviews. Researchers started by searching for a demographic profile for students. It helps them to better understand the context features of students as research respondents.

**Table 1. The demographic information of respondents**

Category	Frequency	Percentage
Gender		
Female	38	63%
Male	22	37%

Level		
Freshman	13	22%
Sophomore	19	32%
Third level	28	47%
Home learning location	11	18%
Rural (in the country)	18	30%
Suburban	31	52%
Urban (in a city)		
Number of students	60	

Table 1 provides a breakdown of the respondents' demographic information. 63% of the respondents questioned were women, whereas 37% were men. Moreover, 22% of respondents were first-year students, 32% were sophomores, and 47% were third. In addition, 18% of respondents indicated that their home learning position is in rural areas, 30% in suburban areas, and 52% in cities.

Table 2 also displayed the voices of students about how they viewed the cognitive engagement aspect of the ERT phenomenon.

**Table 2. Responses of the students towards cognitive engagement aspects**

No	Questionnaire items	Responses	
		Yes	No
1	I try to relate online learning materials to my previous experience and expertise.	92%	8%
2	I compile several examples to help me understand the basic concept.	92%	8%
3	I try to see the similarities and differences between the things I learn and the things I know beforehand, to make all the various ideas come together and make sense.	86.4%	13.6%
4	I go through the subject and pick what I should learn from them instead of merely reading.	88.6%	11.4%
5	While learning online, I incorporate various course concepts in novel ways.	81.6%	18.4%

6	I would like to know what I should do before enrolling in an online learning course.	78.4%	21.6%
7	When I work on in my online class, I pause again and again and go over what I have been doing.	53.4%	46.6%
8	When I study for an online class, I track not only the correct answers but also my level of comprehension.	81%	19%
9	If it's hard to understand what I'm concentrating on during the online learning class, I'm changing the way I learn content.	81.4%	18.6%
10	When studying online, I determine how relevant information from the real world may be.	93.2%	6.8%

Table 2 identified the responses of 60 students to the questionnaire. Such responses were examined by classifying them in the discussion according to the extent of the cognitive engagement dimension. These ranged from responses that varied over the course of online learning based on personal perceptions or experiences, especially in the creation of a predictive model for students' cognitive involvement in online learning.

The data showed students' online learning behaviors that included their participation in internal processes such as learning preparation, use of cognitive strategies, self-regulation, engagement in learning, ability to think critically, and relationships with daily life during the ERT. For learning experiences in the online classroom, the student experience statements were classified "Yes" or "No" as answers described as cognitive engagement. Students have shown a positive response to their cognitive participation during the ERT phase. A significantly high percentage of student cognitive involvement in online learning has been identified.

To explore the insights of more respondents and to enhance the results of the study related to cognitive engagement in the ERT environment, respondents were asked an open question. It relates to the personal experiences or perceptions of students, which may lead to a critical assessment of their beliefs. The question arises as to how students handle online learning processes, such as preparation and the search for knowledge relevant to the subject. The following student interview examples depict these thoughts and feelings,

"I still try to analyze what I've learned and discuss material from a range of sources." (Student 15).

“I plan and schedule each course well to prepare the relevant materials prior to the learning process.” (Student 21).

“I ask questions of the instructor, and I do peer discussions to develop my comprehension of the topics.” (Student 24).

“I read about the subject first before class, so I could get an analogy later when my friends or my lecturer described it.” (Student 39).

“I'm trying to read the syllabus to help me find the learning materials.” (Student 45).

“I'm just reviewing the content I studied a week ago and finding the stuff that I don't understand on the internet.” (Student 59).

“I also find some additional information and sources on the website and try to deal with the issue.” (Student 60).

The findings of the data analysis showed that students were passionate about learning in the ERT climate. They've learned how to get the details and to appreciate the knowledge they've provided. Add to that, they will fully understand how information and understanding can be gained. They have undergone a process of thinking, learning, remembering, and judging through their imagination, observation, and preparation, including problem-solving. In addition, they encourage engagement in online learning to understand what they should learn and to connect to their previous knowledge and experience. They began to grasp how they could participate more actively in their learning processes.

## **Discussions**

Demographic information shows that 63% of respondents are female, 47% are almost at the final level of higher education, and 52% are in the urban area of their home learning zone. Studies also found that the demographic context of students contributes to their attempts to tackle cognitive engagement in the ERT climate. Their home learning location in the city has made it easier for them to have a decent internet connection and it is a convenient facility to explore their cognitive engagement during the ERT process. They were also aware of the higher education learning environment, which requires an autonomous learning capability, even though they were still shocked by the ERT situation.

Demographic details may reflect the student population, condensed in a profile that the instructor can quickly refer back to when designing a learning plan. It is vital to remember that the inability to achieve e-learning cannot generally be linked to technical flaws in the system but rather to a mismatch between the content and the characteristics of the students (Sugawara, Okuhara, Fukuyama, & Sato, 2020). In the current context, in which educational institutions are gradually adopting the concepts and methods of online learning systems for students, many of the institution's online learning programs confront insurmountable obstacles in implementing effective strategies. It is therefore important to analyze the availability of online learning and the characteristics of students that affect it (Cigdem, 2014). In addition, Sugawara et al. (2020) assume that if learning methods do not align with the curriculum design, e-learning might have no learning impact. By using the awareness of this study, educators can be made aware of the aspects that require further attention to the quality of online learning, so that changes and modifications can be made in the online learning instructions.

The results of the questionnaires and interviews suggest that students have positive cognitive engagement in the ERT environment. The use of online learning in the sense of the pandemic situation of COVID-19 contributes to the role of students as self-regulatory actors. They enable themselves to learn effectively by controlling the interests of their learning method in order to understand the material better. They are using their own learning approach. Zhu, Mustapha, and Gong (2020) found that self-regulatory students are tracking their actions and focusing on what they have accomplished. It strengthens their desire to continue improving their strategies by goal setting, mission planning and self-assessment, including help-seeking, time-management, environmental structuring, and regulatory effort planning. This can be seen as a representation of students as part of cognitive communication components that varied according to their experience and subject requirements (Greene, 2015).

In addition, the research result describes that students build their own knowledge by connecting the information they obtain to their scheme during the ERT process. They relate materials to their real-world situation, including their experience and awareness of the past. These



were the superordinate structure and simple methods of thinking about what they were doing, thinking about how best to do it, and the dedication of thought to applying methods (Aarto-Pesonen & Piirainen, 2020; Greene, 2015). Furthermore, students continue to be involved in finding the right path through the ERT process and agree on their learning objective, which is consistent with the program's objective. Students must demonstrate the ability to reflect on their classroom and afterschool experiences, to integrate their knowledge from different courses, social events, life beyond school, and to apply their knowledge in different contexts that present new challenges and opportunities (Kuh, 2016).

Students frequently generate their original material by locating external knowledge from all learning sources and collaborating with classmates to solve a problem, complete an assignment, or create a product. Valli, Valli, and Lähdesmäki (2017) also mentioned that the interactive learning environment will involve students and make it possible to develop knowledge in a collaborative and innovative way, as well as to collaborate actively with outside-school experts and communities. Through this perspective, we can ultimately see that students with cognitive engagement implicitly applied the concept of effective learning by making comparisons to, and helping to recognize other previously established information. This strengthens their understanding of the material. This characterizes meaningful learning, which students believe to be the heart of the learning process. It occurs when students can construct new knowledge based on ERT-learned material.

Teachers should recognize that students will be engaged in their learning activities by enhancing the student's purpose. Students must find their studies personally meaningful. They also comprehend the significance of what they are learning and can relate at least a portion of what they are learning to other parts of their lives that they deem significant if they are to succeed and keep learning (Kuh, 2016). Most students agree that students and teachers play essential roles in the ERT setting. In addition, due to students' belief that teachers are still the center of learning as authoritative leaders, they represented teachers as the key agents for fostering and enhancing their cognitive participation. Teachers have made a contribution to shaping students' cognitive

engagement, including drive and self-confidence. It is a challenge for the teaching profession to be able to promote the ERT cycle. The willingness of teachers to access online professional learning training is a must. Due to the rapid pace of ecosystem learning through the ERT loop, lifelong professional development is becoming necessary for teachers. Moreover, with the expansion and prominence of Information and Communication Technology (ICT) in education, technology-enhanced professional learning is crucial for teachers who may generate new ideas, teaching strategies for students, and more flexible work environments (Xue, Hu, Chi, & Zhang, 2021). Professional teaching is generally recognized as a mediating factor for improving student outcomes and focuses on modifying teaching behaviors (competence, expertise, skills, understanding, values, attitudes, or beliefs) (King, 2016).

This study draws more attention to the need for continuing professional development of teachers in the ERT situation by focusing on the needs of students. Students were found to have a high concentration of cognitive engagement by calculating the proportion of cognitive contributions. This percentage means that students have been able to adapt and follow the content of materials through some self-regulation during online learning. Through the awareness of this study, educators will be made aware of specific areas that require further attention to the quality of online learning in order to make changes and changes to the online learning directions. The result shows that students have positive cognitive involvement in the ERT environment.

## **Conclusions**

In this research, we have shown that students' cognitive participation in the ERT community has stimulated student self-awareness. They are becoming their own boss, who takes the initiative and decides how to interpret the learning material clearly. The cognitive dimension of engagement developed by Reeve and Tseng (2011) and Fredricks and McColskey (2012) has shown that cognitive engagement is an internal process, such as in-depth thought, use of cognitive strategies, self-regulation and involvement in learning, ability to think critically, and relationships with daily life. The present study found that this model aims to explain how students interpreted the cognitive engagement aspect of the ERT phenomenon.

Our findings offer several practical implications. The ERT environment depicts the way students consciously approach the learning scenario. In our study, trial, and error in the implementation of the ERT method implicitly allows students to tolerate and participate in cognitive activity effectively. They understood that the pandemic situation of COVID-19 causes drastic changes in the way they learn, and on the other hand, there is no shift in the learning goal that they need to accomplish. Teachers, meanwhile, may assist students by constantly improving their professional growth. Teachers have the greatest contribution to have some reasonable stimulus to involve students in ERT environment cognitive interaction. Conditioning students to find a proper way to perceive, create and apply the material in question through self-reflection and development during the ERT process. In addition, it is important for the teacher to better understand how the situation of the COVID-19 pandemic affects the condition of students in order to improve the online learning environment. In broadening this study, it is important to encourage an efficient method to help student cognitive engagement in the COVID-19 pandemic situation.

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