IDENTIFYING AND OVERCOMING SOME FATIGUE-CAUSING FACTORS EXISTING IN ONLINE READING CLASS OF AMIKOM PURWOKERTO PSDKU YOGYAKARTA DURING COVID-19 QUARANTINE

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Abstract

COVID-19 forced AMIKOM Purwokerto to convert its traditional classes to online learning. During this online learning, problems have started to unravel, and one of them is fatigue, which was confirmatively experienced by 55% students of Reading IV. This study, utilizing a quantitative research method, intended to find the causes of the fatigue and design practicable solutions. Through observations, group interview, and literature reviews, some main factors that caused fatigue were revealed: Zoom fatigue; tasks which were too difficult and numerous; presentation of materials which did not properly comply with the students’ online conditions and unfamiliarity to Google Classroom; eye fatigue (digital eye strain), bad postures during learning, lockdown fatigue, and frustration over signal and internet problems. To overcome the fatigue, the researchers reduced the time for video conferences and created asynchronous short videos for learning, selectively adjusted tasks in terms of number and difficulty, simplified presentations of materials and helped the students to become more familiar with Google Classroom, and addressed the problems from eye strain, bad postures, and lockdown fatigue in the reading materials so the students could solve those problems based on the texts given or find a more viable solution. Those solutions reduced the number of drained students to only 25% and in addition 60% students claimed that the modifications brought a positive impact on their learning.

Keywords: fatigue, distance learning, COVID-19, Zoom fatigue
Introduction

As the contagious COVID-19 quickly rose from a local threat in a Chinese city of Wuhan to a global pandemic, nations around the world took initiatives to stop the infection by banning large gatherings. One sector directly affected by such a ban is educational institution, in which knowledge transfer activities constitute large gatherings.

Indonesia confirmed its first COVID-19 case on 2 March 2020 (Ratcliffe, 2020) and passed a ban on gatherings starting on 16 March 2020, requiring educational institutions to close down their face-to-face classes during the COVID-19 pandemic (Sipahuntar, 2020). Educational institutions responded to this very short notice by abruptly converting their traditional face-to-face class activities to Pembelajaran Jarak Jauh (distance learning), mostly in the form of virtual world learning (Jakarta Globe, 2020). The 68 million affected Indonesian students (Yarrow & Riaz, 2020) continued their education from home. This sudden change from traditional class to online class also took place in AMIKOM Purwokerto PSDKU (Program Studi Di luar Kampus Utama/off-main campus study program) Yogyakarta, particularly the Reading IV class.

Online learning becomes a favorable choice partly because it has been a subject of a lot of researches and discussions with favorable conclusions. O'Sullivan (2017) wrote that carefully-designed online learning allows international students to continue their education from the comfort of their own homes. Online learning also, according to a research by Nguyen (2015), is as effective as traditional education. Retention rate of e-learning is also higher at around 25% to 60%, compared to that of classroom which is 8% to 10% (Daily Infographic, 2019).

With researches on online learning giving promising conclusions, an unprecedentedly large scale nationwide e-learning started to be implemented in Indonesia. However, problems have also started to unfold, starting from unfamiliarity with such a method (Purandina, 2020), weighty additional spending for internet (Zhafira, 2020), to unreliable or even inexistent internet connections and a negligible number of gadget owners and users (Putri, 2020).

In her article in Kompas Muda, Damayanti (2020) revealed that one of the problems experienced by many students is fatigue. Reasons for fatigue vary. The governor of Jakarta, Anies Baswedan, as reported by Tribunnews reporter Triatmojo (2020), warned that learners may suffer from fatigue if curriculum and teachers do not conform the
guidance that the learners need. Another reason for fatigue, as divulged by Damayanti, is staring gadget screen every day, too many class assignments, studying too many materials, insufficient time for studying and working on tasks, and improper time management which results in failure to define when to learn and rest.

In addition, communities, in which students belonged to, also suffered from a newly defined type of fatigue. Dubbed by media as “lockdown fatigue”, this fatigue is believed to be developed during the COVID-19 lockdown imposed by the governments.

A number of students of AMIKOM Purwokerto PSDKU Yogyakarta who took the Reading IV online class also claimed to experience fatigue. Fearing that their fatigue might be detrimental, the researchers, one of whom teaching in that college, were intent to reveal the fatigue-triggering factors and designed solutions to the fatigue.

**Literature Review**

**Fatigue**

Being a common occurrence among community (Abdel-Khalek, 2019, p.15), fatigue is a word familiar to most people. Simply said, fatigue is a personal, subjective, and undesirable experience which puts its sufferer under “a mental or physical state of tiredness and lack of energy” (Labrague & Ballard, 2021, pp. 1-2). Schlick et al. (2010), described fatigue as “a response to stress that can trigger mental and/or physical reactions within the human body” (Winkelhaus et al, 2018, p. 833). In correlation to energy consumption and performance, Winkelhaus et al., having analyzed various theories, concluded that fatigue is “the difference between the accumulated energy expenditure during the execution of the task and the accumulated energy expenditure at rest (p. 833)”.

Although appearing to be trivial, fatigue brings about several adverse effects. Some of those observable detrimental results are, according to Chen at al. (2015), “task performance decrement, cognitive impairment, and emotional disturbance (p. 741)”. Being in agreement with Chen et al.’s opinion, Labrague and Ballard (2021) wrote that people suffering from fatigue are “engulfed with an overpowering sense of tiredness that is not relieved by rest or food intake, intense yearning to rest, lack of physical and mental energy, and decreased motivation and sense of enjoyment. (p. 2)” In addition, fatigue “diminishes an individual's ability to perform normally on a daily basis and may
consequently lead to a decreased quality life (p. 2).” School children suffering from fatigue, claimed Chen et al. (2015), may soon see “a decline in school performance, negative health outcomes, and refusal to attend school (p. 741)”. Considering that fatigue may lead to so many ill effects, no wonder that fatigue, “which is highly prevalent among undergraduate college students,” “negatively impacts academic performance, cognitive functioning, and psychological well-being (Nyer et al., 2015. p. 101)”, and becomes one of the most common sources of complaints by college students (University of Iowa Health Care, 2017).

During COVID-19 lockdown, citizens were reported to suffer from “lockdown fatigue”. This feeling of fatigue people experienced during this pandemic is, wrote Robinson & Leach (2020) in The Conversation, likely “related to the mental workload associated with COVID-19 rather than the physical burden (par. 2)”. In addition, the monotony of situations also contributes to the feelings of being tired. Still according to the same article by Robinson & Leach (2020), the pandemic triggers feelings of uncertainty, confusion, and trepidation among people. Those feelings induce stress and anxiety. Tackling those psychological strains causes people to feel tired, but if those emotional problems are left untreated, they worsen the sleep quality, which will lead people to be more tired and anxious. To sum up, psychological problems will give rise to fatigue one way or another.

A research by Labrague and Ballard (2021) adds another supporting piece of information. They observed that “fatigue or a mental or physical state of tiredness and lack of energy is one of the most common reported consequences of the lockdown or home confinement measures during the COVID-10 pandemic. (p.1)” This fatigue, which is dubbed lockdown fatigue, they explained "occurs due to the overwhelming disruptions on an individual's routines and activities, social isolation, lack of security, imminent threat to health, and unpredictability of what is ahead, and may manifest as a mix of physical, mental, and/or emotional signs. (pp. 1-2)"

**Zoom fatigue**

As distance learning commenced globally due to the rise of COVID-19, people around the world started to experience exhaustion, which is traceable to the uses of video call (Jiang, 2020). Media tellingly call this phenomenon “Zoom fatigue”. Wiederhold, quoting Wolf (2020), described Zoom fatigue as “tiredness, anxiety, or worry resulting from
overusing virtual video conferencing platforms (2020, p. 437). While containing the word “Zoom”, this symptom does not only occur to people who use Zoom video call application. Users of other video call applications such as Skype, FaceTime, and Google Meet (formerly Google Hangout) also suffer from it.

On the triggers for the Zoom fatigue, opinions from experts, scholars, and experienced users vary. However, most seem to be agreeable to Fosslien and Duffy’s reports which say that fatigue is induced by the extremely intensive focus on conversation to absorb information and the unnatural constant gaze during video call (2020). Sander and Bauman (2020) also added that the video call attendants consume more energy than those involved in a face-to-face meeting. The reason why more energy is spent during video call lies in the differences of the natures of video call and direct face-to-face communication. It is natural for people to subconsciously pay attention to emotion and non-verbal clues during communication, such as facial expressions, the tone and pitch of the voice, gestures, posture and the distance between the communicators. In a direct face-to-face communication, people have a better access to perceive those clues. A video call communication limits such an access. Accordingly, people need to spend more efforts to process those clues. Sander and Bauman’s theory is also similarly voiced by another article by Sklar (2020), who believed the possibility that “Zoom fatigue will abate once people learn to navigate the mental tangle video chatting can cause”.

Some people may simply dismiss Zoom fatigue as triviality. However, if people are exposed to Zoom fatigue for an extended period of time, warned Rosdiana Setyaningrum, MPsi, MHPEd, the Center Director MS School & Wellbeing Center, their productivity may drop and mental health issue may arise (Anindiati, 2020). Accordingly, Zoom users should try to avoid and overcome Zoom fatigue as best as possible.

**Method**

As this research was a quantitative in nature, information was collected through a data triangulation consisting of observation of students’ personal feedbacks and Whatsapp interactions, personal observation of the students’ conditions via video, and group video interview. This triangulation was performed to ensure the validity of the data (Gall et al., 2009, p. 14). A Likert-based questionnaire was also
distributed during the interview to gather relevant information on the class.

The participants of the research were the AMIKOM Purwokerto PSDKU Yogyakarta students who took Reading IV during 2019/2020 academic year, all numbering twenty (20) students.

The first data was obtained when some students, via students’ personal feedbacks, claimed they were suffering from fatigue. This information aligned with some complaints by some students in Reading IV Whatsapp group, stating that they easily got tired. Responding to these discoveries, the researchers performed observations over the class conditions via video. Collective video interviews would follow. One interview was planned to last for a maximum of 15 minutes. A literature research was also performed to gain deeper understanding on the causes of fatigue during the COVID-19 distance learning and design feasible solutions. When the solutions were available, the researchers would collect students’ opinions to see if the solutions worked.

**Discussion**

**Discovery**

The facts previously presented by Damayanti and Triatmojo corroborated the results of the students’ feedbacks observed by the researchers. Analyzing the personal feedbacks, the researchers discovered that after four weeks of distance learning (on 15 April 2020), the number of Reading IV students who claimed to have been experiencing fatigue peaked at 55% (11 students out of 20). Those students’ descriptions of the exhaustion they experienced varied, such as mild or severe fatigue, simply feeling tired, and eye-strain. The researchers analyzed the Reading IV Whatsapp group and spotted that some students had started complaining that they had been experiencing fatigue as early as 27 March 2020. Students complaining about their fatigue in Whatsapp group numbered fewer than those reporting it in on the students’ feedbacks, peaking at only six (out of 20) students on 9 April 2020 compared to 11 students in 15 April 2020. Nevertheless, it showed that students had been trying to vent their frustration over the fatigue they had been experiencing through anything they deemed fit as to alleviate some of their burden.

Following which, the researchers observed the incoming class session via video and discovered that seven students exhibited tangible
signs of fatigue, with lethargy being the most common symptom. To find a solution to the fatigue, the causes should be identified first. Thus, video interviews were conducted to obtain more information on what triggered the fatigue. All students were requested to attend group interviews. The group interviews, occurring three times, provided more detailed symptoms and possible causes of fatigue such as mentally or physically tired; severe, moderate, or mild fatigue; feeling sleepy and/or sluggish; eye-strain; and a combination of two or more of them.

A literature research was also conducted. The resultant conclusion thus added more information on the fatigue, some of them are (1) anxiety and stress may cause fatigue, (2) wrong sitting posture (which was not mentioned by the students but was identified during observation) depletes energy, (3) the existence of lockdown fatigue, and (4) a new phenomenon called Zoom fatigue has arisen.

The researchers then processed the data obtained and concluded that there were four relevant major causes of fatigue and/or distress during the distance learning. Those four were Zoom fatigue, assignment-related, improvable delivery and presentation of materials, and miscellaneous factors.

1. **Zoom fatigue**

As the cause of Zoom fatigue is the extended use of video conference applications, the researchers decided to reduce the uses of Zoom and other video conference applications. Reading IV online class was designed to no longer be heavily reliant to the use of such applications.

The researchers’ solution tallied with Wiederhold’s (2020) conclusion which says the most important thing to avoid Zoom fatigue is to limit the use of video conference technology. Similar advice was also offered by Fosslien and Duffy (2020).

Zoom was only deployed mostly at the first and last ten minutes of the class, serving as a greeting, presentation of the goals, introduction of activities at the beginning of the class, and consultation and discussion at the end of the class. However, when conditions demanded, Zoom was still used to address the needs, for example when the class learned and practiced the “think aloud” method (stating loudly what a person has in mind when s/he reads a text).

For materials that required direct guidance from the lecturer, instructional videos were created and uploaded to Google Classroom or
the Whatsapp group. While asynchronous (non-live video) videos might be against the recent trend, Didin et al. (2020), in their research revealed that recorded videos offered significant benefits to the learners of online class in the form of students’ satisfaction (p. 54).

The length of the recorded video was decided to be about three to six minutes. The numbers came from mainly two references. The first source, a research performed by Berg et al. (2014), mentions that students prefer a video that runs no more than 15 minutes (p. 8). The second source by Guo et al. (2014) reveals that median engagement of a video, regardless of its length, peaks at the sixth minutes. The highest engagement was observed on videos whose length is zero to three minutes (p. 44).

As it was impossible to create a six-minute-long video which covered a whole lesson, the video was divided into smaller sessions, each session running for about three to six minutes. One class session was set to rarely use more than six smaller videos. The decision to set the maximum number of videos to six was made because the researchers saw that the screen looked cluttered when six or more videos appeared. Besides, students started to noisily flood the chat with complaints when they saw more than five videos for download, indicating that students felt annoyed as soon as they realized they had to watch six or more videos in just one particular class session.

2. Assignment-related problems

During quarantine, students complained that the assignments given to them were too overwhelming in terms of quantity and difficulty. While an individual task from a lecturer rarely saps students’ energy, collectively, those assignments drain the students’ strength and/or incited mental fatigue. In their research, Robiasih and Lestari (2020) already warned that tasks given to students without considering students’ conditions may end up overwhelming students and badly affecting their wellness (p. 81). One example of Robiasih and Lestari’s dismay is presented in Damayanti’s (2020) article. Her article in Kompas Muda published a complaint from a college student saying that students received a lot of assignments at a random time beyond the previously agreed schedule while lecturers’ guidance was insufficient if not totally absent. Another media, Tirto.id, disclosed a student’s expression of dissatisfaction because she had to spend her time from morning to evening working on tests given by her teachers without the
essentially needed direct guidance from the teacher and conducive atmosphere at home (Jannah, 2020).

Worse, assignments were not only problematic to students in term of quantity. Sometimes students had to work on assignments which were too difficult or even impossible to complete. (2020), KPAI (Indonesian Children Protection Commission) provided a case in which a student had to make a short movie, published it, and obtained at least 200 likes within a relatively short time frame of two days (Jannah, 2020). The assignment was too difficult to accomplish considering that other teachers also requested him/her to do other tasks and the procedures of making and editing movie would require a longer time. Another impossible task given by a teacher was to chat with the US President Donald Trump, Microsoft founder Bill Gates, and Facebook founder Frank [sic] Zuckerberg via LinkedIn, a professional networking and career social media (Artiyono, et al., 2020).

For the Reading IV class, in which this research was taking place, the students’ responses on the quantity and difficulty of the assignments given to them were measured using questions in a Likert-based questionnaire. The result is presented in the following.

|                              | I feel the tasks are too many. | I feel the tasks are too difficult to work on. |
|------------------------------|--------------------------------|-----------------------------------------------|
| Agree                        | 8 (40%)                        | 5 (25%)                                       |
| Neutral                      | 10 (50%)                       | 12 (60%)                                      |
| Disagree                     | 2 (10%)                        | 3 (15%)                                       |
| Total                        | 20 (100%)                      | 20 (100%)                                     |

Eight students (40%) believed that the number of Reading IV tasks was too many, while two students (10%) believed that the amount of tasks was not too many, and the remaining ten students (50%) chose “neutral” as the answer to the question asking whether they felt the tasks were too many.

Asked whether the tasks were too difficult, 60% (12 students) selected “neutral” as their responses, while the number of students who agreed and strongly agreed that the tasks were too difficult (five students (25%)) slightly outnumbered the students who thought that the tasks were not too difficult (three students (15%)).

Data shows that students who chose neutral were the majority, meaning that the majority felt there was nothing wrong with the
difficulty and the amount of the tasks given. To get more accurate picture, the researchers also observed the students’ scores by comparing the score before and during online class.

A score comparison of the two tasks indeed showed a slight drop generally. The first task was performed on 11 March 2020 when the traditional face-to-face lecturer still occurred. The second task to compare was the one given to the students on 15 April 2020, in the fourth week of the online class, with the assumption that the students were already getting used to the online class and could perform their best. The brief result of the comparison was as follow:

|                  | Before online class | During online class |
|------------------|---------------------|---------------------|
| Highest score    | 100                 | 100                 |
| Lowest score     | 65                  | 55                  |
| Range            | 35                  | 45                  |
| Mean             | 79.25               | 75.5                |
| Median           | 77.5                | 72.5                |
| Mode             | 65                  | 70                  |

The comparison shows a widening of the score range, as well as slight drops on the highest and lowest scores, mean, and median of the overall class scores, indicating that students’ scores experienced a downturn. This might support the results of the data obtained previously which reveal that some students felt the difficulty level and quantity of the weekly tasks were burdensome.

The researchers thus decided to selectively lower both the difficulty level and number of the tasks without compromising the integrity of the tasks. First, questions on vocabulary, synonym, antonym, and anything not directly related to the comprehension of the text (such as grammar) were converted from cloze questions into multiple choice questions. Contents of the texts would still be tested in the form of cloze questions. Most questions on theoretical reading concepts like skimming, scanning, and text types were eliminated to lower the number of question on tasks. Additional tasks, such as comparing two types of texts or finding a similar text with the one being discussed would be given less frequently. With both the number and the difficulty of the tasks lowered selectivity, the researchers believed the fatigue and anxiety that plagued the students should abate.
3. **Improvable delivery and presentation of materials**

Another factor that consumed the energy of some students was those students’ dispreference toward the delivery and presentations of materials. Reading IV class, after resorting to online learning, utilized Google Classroom, WhatsApp messaging app, and Zoom video app for its material delivery platforms. The reason behind this choice was because most students already used WhatsApp often and had been trained to use Google Classroom in the previous semester. Zoom was relatively new for both researchers and students, but as other AMIKOM Purwokerto lecturers used it as well, claiming that it was easy to use, students were expected to be accustomed to it more quickly.

The group interview discovered that only 40% of the class claimed they had positive view towards the use of Google Classroom. Out of 20 students of the Reading IV class, only eight (40%) claimed that they had a favorable view toward Google Classroom. Seven students (35%) were not content with Google Classroom and the remaining five students (25%) said they had neither favorable nor negative opinion toward Google Classroom. WhatsApp fared better with 14 students (70%) showing favors towards the use of WhatsApp and the rest six students (30%) being not content or discontent. Zoom also received a favorable view from 12 students (60%) and only two students (10%) had an unfavorable view while six students (30%) observed their neutrality.

|                      | Google Classroom | Whatsapp | Zoom |
|----------------------|------------------|----------|------|
| Positive             | 8 (40%)          | 14 (70%) | 12 (60%) |
| Neutral              | 5 (25%)          | 6 (30%)  | 6 (30%)  |
| Negative             | 7 (35%)          | 0 (0%)   | 2 (10%)  |
| Total                | 20 (100%)        | 20 (100%)| 20 (100%)|

Focusing on the below-expectation performance of Google Classroom, the researchers finally learnt that some students still felt unfamiliar with interfaces of Google Classroom, its supportive amenities, or the platform where it runs (such as browser or operating system). An example when unfamiliarity took its toll was when a student could not locate his/her downloaded file because s/he did not know that the file downloaded was automatically put in a certain “Download” folder by the browser’s default settings without his/her confirmation.
To settle this problem, the researchers dedicated an additional 30 minutes for a re-training session. After re-training, students were then encouraged to share their problems with others during class so they could receive solutions immediately either from their friends or the researcher in-charge. As habituation finally took place, the researchers believed that students would be sufficiently proficient in using Google Classroom.

As their mental strain in the form of displeasure caused by unfamiliarity with Google Classroom was redressed, the students were expected to suffer from stress no more and consequently develop no fatigue from the disappearing stress.

The format of the material presentation was also a subject of complaint from some students. Those students, during the group interview, claimed that the materials presented were too many, too disorganized, and boring.

Table 4: Students’ opinions towards the presentations of online Reading IV materials.

| I believe that the materials presented were | too many | disorganized | boring |
|---------------------------------------------|---------|--------------|--------|
| Agree                                       | 8 (40%) | 11 (55%)     | 6 (30%)|
| Neutral                                     | 7 (35%) | 5 (25%)      | 11 (55%)|
| Disagree                                    | 5 (25%) | 4 (20%)      | 3 (15%)|
| Total                                       | 20 (100%)| 20 (100%)    | 20 (100%)|

The researchers assumed that this problem stemmed from the different natures of traditional face-to-face class and online class. In a traditional face-to-face class, teachers can rely on the visual expressions of the students and make an adjustment during presentation if necessary. For example, if the students look confused, the teacher understands that a better explanation is required. General online class cannot provide visual hints as properly as traditional class does, thus teachers cannot quickly adjust their presentations in response to the conditions that students are in.

Due to the limitation of available technology-in-use, obtaining a better visual feedback from the class is out of question. Thus the researchers decided to improve the format of the presentation instead. The improvement would adopt advice from Sundar, an education consultant and researcher who believes that effective learning may result from minimalism. She recommended that educators, while designing a remote learning material, should “keep it simple (avoid
irrelevant content), keep it short (break ideas into smaller chunks), keep it together (put materials for one session in one file), build the base first (introduce required knowledge or terms at the beginning of the lesson), and leverage technology with guidance (make use familiar or easy-to-learn technology for class) (Sundar, 2020).

Accordingly, the researchers decided to modify the material presentations to make them simple, more organized, and more attractive to the eye based on the minimalism Sundar proposed. Examples of the modifications were (1) Presenting only essentially relevant information and to some extent, necessary supportive knowledge such as clearly relatable examples, while deleting the rest. Basically, the presentations should give the students solely what they need to acquire instead of what the lecturer wants them to know. (2) Trimming ppt/pptx presentation files, making them less wordy and containing only important information. (3) Providing visual elements such as charts or infographics instead of long descriptions. (4) Replacing wordy descriptive paragraphs with bulleted points. (5) Locating a particular timeframe (for example, 00:03:34 to 00:05:00) in long videos from external sources, such as YouTube, rather than only providing a link to the complete video which may contain information impertinent to the very topic discussed. (6) Decluttering a cluttered presentation of materials and breaking them down into several easily learned and simple lessons because a cluttered display of materials instigates a chaotic process of thought (Pappas, 2017). These modifications addressed the problems in the presentations of materials that the students complained, helping them keep their minds more focused during learning without succumbing to fatigue.

4. **Lockdown and other miscellaneous factors**

Through literary research and observation, it was revealed that there were a lot of mental-and-physical-fatigue-inducing factors impertinent to the pedagogic side of the online class. Discussing and overcoming those factors, therefore, should be beyond the scope of this research. However, some of those factors were addressable and could even be used to augment the Reading IV class learning process. Thus, the researchers decided to discuss them briefly in this research.

One factor to blame was poor posture during distance learning. According to Strauss (2020), although poor posture has already been blamed for a lot of physical problems long before the age of computer,
there has been an increase in back strain and other physical problems due to poor ergonomics in schools where students are doing work digitally. Farber (2020), quoting an article from Harvard Health Publishing, reported for Fox News that some other physical problems resulting from bad posture are fatigue, shoulder pain and impingement, jaw pain, incontinence, constipation and slow digestion, and heartburn. The Washington Post reported that many students and their parents got back and neck problems as a result of their bad posture while using the computer (Strauss, 2020).

Eyes are also vulnerable to fatigue. Such fatigue usually results from long exposure to gadget screens, especially if the focus is tiny types. Forster (2020) quoting President of the American Optometric Association, Barbara L. Horn, O.D., wrote that such unhealthy exposure produces eye discomfort and vision problems named “computer vision syndrome” or famously known as “digital eye strain”.

Fatigue can also arise from the frustration over internet connection and spending. The ministry of education and culture told DetikNews that slow internet was addressed as a problem by a lot of students (Astuti, 2020). Slow internet hinders students from properly attending video class and quickly completing their lessons, as well as tests their patience level and triggers stress and fatigue. Another internet-related problem, the weighty additional spending for internet, also becomes a hindrance to online learning process and was brought to the attention of Commission X of the Indonesian House of Representative by Budi Djamtko, the Chairperson of Association of Indonesian Private Universities (Aptisi) (Putra, 2020). Thus, skyrocketed additional internet spending may incite stress which will in turn give rise to fatigue.

The main culprit, however, is the lockdown fatigue, which was already mentioned previously in the Introduction section. Being an accumulation of various mental discomforts and strains during the lockdown, lockdown fatigue also negatively affected the physical state of some students of the Reading IV class in the form of exhaustion.

With the three fatigue-causing factors, i.e. poor posture, digital eye strain, and lockdown fatigue, identified, the researchers believed it was necessary for students to identify those factors and avoid the problems resulting from them. As it was a reading class, it would be better to impart the knowledge about those three problems through
reading texts instead of lecturing and admonishing them over those matters.

Following which, the researchers collected several articles on the three problems, read and comprehended those articles, and prepared reading texts on poor posture, digital eye strain, and lockdown fatigue for the students. Short videos were created to help students understand the texts and instructions.

Next, during the live greeting session, the lecturer greeted the students and asked how they were doing, then used this session to address one problem, for example, poor posture. The addressing of bad posture was interspersed among class interaction activities, so it did not dominate the session and become a pure lecture on poor posture instead. This served to build their initial knowledge and pique their interest on poor posture. When the live session ended, students were required to download and watch the videos on the topic, which contained instructions and knowledge pertaining the text and its contents.

While students were working on the text and tasks, the lecturer monitored the students’ interactions in both Google Classroom and the Whatsapp group chats, clarifying things and offering required assistance. As for the live closing session, the lecturer presented her findings, made some necessary feedbacks, and allowed students to interact with one another through some classroom activities such as asking one to answer another student’s doubt and correcting and confirming others’ answers. Then the lecturer reminded them to keep a good posture before closing the session. Relatively similar steps also applied to the texts on digital eye strain and stressful conditions during 2020 COVID-19 pandemic. It was expected that the students, having attained knowledge on the poor posture, digital eye strain, and stressful conditions during pandemic the texts, would apply solutions offered by the texts or seek for more adoptable remedies. In addition, exchange of lively communication during limited video conference calls, which was initially designed to tackle Zoom fatigue, was also expected to encourage students with the presence of their friends.

The explosive rise of internet quota consumption starting since the beginning of online class was expected to be slightly controlled as full class live video session was now limited. The simplification of contents also reduced the sizes of files to be downloaded.
The frequent absence of stable internet connection was something beyond the ability of the researchers to fix. However, the limitation of live sessions to only the beginning and the end of the class helped students to focus on the core contents of the class in the form of files that they could download asynchronously when the internet connection stability improved.

**Results of the Solutions**

Three weeks after the implementations of the solutions aforementioned, the researchers observed the students’ personal feedbacks and discovered that the number of students saying they were physically and mentally drained dropped from eleven students (55%) to only five (25%). The Reading IV Whatsapp group also showed a reduction of complaints about fatigue, from six students (on its peak before the implementations of solutions) to at most four (after the solution was implemented).

The observation conducted during the three weeks of the implementation of solution via Zoom still showed that fewer students displayed observable signs of fatigue. During the group interview conducted at the end of the research, students also claimed the solutions helped them experience less fatigue and anxieties.

In addition, 12 (60%) out of 20 students said that they benefitted from the changes one way or another, and six students (30%) selected “neutral” as their answer and two students (10%) disagreed with the statement.

**Conclusion**

The implementation of the aforementioned solutions to the fatigue plaguing the students taking the Reading IV distance class during COVID-19 restriction was a success. The number of students claiming to experience fatigue dropped from eleven (55%) to five (25%). The researchers conducted a survey to see whether the changes had a positive impact on the learning, and 60% students confirmed that they felt the modifications made their learning better.

This study, in which the participants were students of Reading IV class of AMIKOM Purwokerto PSDKU Yogyakarta, revealed various factors that induced the fatigue they experienced. Those factors were improper use of video conference application (Zoom fatigue), assignments which were too many and/or too difficult, presentations
and delivery of materials which did not fit the students’ conditions, and miscellaneous factors, like poor posture, digital eye strain, internet connection problems, and lockdown fatigue.

Zoom fatigue problem was handled by cutting the length of live video conference to about 20 minutes (10 minutes at the beginning and 10 minutes at the end of the class) and resorting to short videos recorded by the lecturer. Some assignments were converted from cloze questions to multiple choice questions. To reduce the number of questions, only tasks designed to probe the students’ understanding of the reading text were kept, while unessential tasks intended to measure the students’ knowledge of the pure theoretical grounds were removed, and some other tasks were given less frequently. Problems derived from poor posture, digital eye strain, and stressful conditions during quarantine were brought to the attention of the students through texts and the students were expected to apply the solutions to those problems or find a more applicable solution. Lastly, the simplification of content presentations and cutting short live class sessions were expected to mollify problems originated from unreliable slow or frequently disconnected internet and/or rising internet costs.

This research still has room for improvement. For example, it might have given a more promising result if modifications had been made to several other subjects simultaneously as well, not limited to only Reading IV. Better results might also be obtained if students were exposed to the efforts for a longer period of time. Therefore, the researchers hoped that this research may serve as a reference to future researches discussing fatigue in online class.

References
Abdel-Khalek, A. (2019). Prevalence rates of chronic fatigue complaints in a probability sample of Arab college students. *Heart and Mind, 3*(1), 15. https://doi.org/10.4103/hm.hm_49_19

Artiyono, S., Muslimah, S., & Hidayati, N. (Ed.). (2020). Viral Tugas Sekolah Anak SMP untuk Chat dengan Donald Trump dan Bill Gates. *Kumparan.* Retrieved on Jul 9, 2020, from https://kumparan.com/kumparannews/viral-tugas-sekolah-anak-smp-untuk-chat-dengan-donald-trump-dan-bill-gates-1tWm79eSKxj/full
Astuti, Nur Azizah Rizki. (2020). Survei Kemendikbud: Internet Lemot Dikeluhkan Mahasiswa Saat Belajar Daring. DetikNews. Retrieved on Aug 27, 2020, from https://news.detik.com/berita/d-5086325/survei-kemendikbud-internet-lemot-dikeluhkan-mahasiswa-saat-belajar-daring

Berg, R., Brand, A., Grant, J., Kirk, J., & Zimmerman, T. (2014). Leveraging recorded mini-lectures to increase student learning. Online Classroom 14(2), 5, 8.

Chen, T. Y., Chou, Y. C., Tzeng, N. S., Chang, H. A., Kuo, S. C., Pan, P. Y., Yeh, Y. W., Yeh, C. B., & Mao, W. C. (2015). Effects of a selective educational system on fatigue, sleep problems, daytime sleepiness, and depression among senior high school adolescents in Taiwan. Neuropsychiatric disease and treatment, 11, 741–750. https://doi.org/10.2147/NDT.S77179

Daily Infographic. (2019) The Future of Online Learning [Infographic]. DailyInfographic.com. Retrieved on Aug 27, 2020 from https://www.dailyinfographic.com/blog/future-of-online-learning

Damayanti, Elsa. (2020). Apa kabar mahasiswa dengan kuliah daringnya?. Kompas Muda. Retrieved on Jun 19, 2020 from https://muda.kompas.id/baca/2020/04/17/apa-kabar-mahasiswa-dengan-kuliah-daringnya/

Didin, Fatin S., Mardiono, I., & Yanuarso, Hersa D. (2020). Analisis Beban Kerja Mental Mahasiswa saat Perkuliahan Online Synchronous dan Asynchronous Menggunakan Metode Rating Scale Mental Effort. Jurnal OPSI 13(1), 49-55. https://doi.org/10.31315/opsi.v13i1.3501

Farber, M. (2020). Coronavirus prompts people to work from home: How is posture affected?. Fox News. Retrieved on March 21, 2020, from
https://www.foxnews.com/health/coronavirus-work-from-home-posture-tips

Forster, Victoria. (2020). Are Your Eyes Hurting During The Coronavirus Pandemic? You May Have “Computer Vision Syndrome”. Forbes. Retrieved on Jul 2, 2020 from https://www.forbes.com/sites/victoriaforster/2020/06/01/are-your-eyes-hurting-during-the-coronavirus-pandemic-you-may-have-computer-vision-syndrome

Fosslien, Liz & Duffy, Mollie West. (2020). How to Combat Zoom Fatigue. Harvard Business Review. Retrieved on May 21, 2020 from https://hbr.org/2020/04/how-to-combat-zoom-fatigue

Gall, M. D., Gall, J. P., & Borg, W. R. (2009). Applying Educational Research: How to Read, Do, and Use Research to Solve Problems of Practice (6th ed.). Pearson.

Guo, Philip J., Kim, Juho, & Rubin, Rob. (2014). How video production affects student engagement: an empirical study of MOOC videos. In Proceedings of the first ACM conference on Learning @ scale conference (L@S ’14). Association for Computing Machinery, New York, NY, USA, 41–50. DOI:https://doi.org/10.1145/2556325.2566239.

Jakarta Globe. (2020). Cities Turn to Online Learning to Prevent Covid-19 Spreading Among Students. Jakarta Globe. Retrieved on March 21, 2020 from https://jakartaglobe.id/news/cities-turn-to-online-learning-to-prevent-covid19-spreading-among-students

Labrague, L. J., & Ballad, C. A. (2021). Lockdown fatigue among college students during the COVID-19 pandemic: Predictive role of personal resilience, coping behaviors, and health. Perspectives in psychiatric care, 10.1111/ppc.12765. Advance online publication. https://doi.org/10.1111/ppc.12765
Nguyen, Tuan. (2015). The Effectiveness of Online Learning: Beyond No Significant Difference and Future Horizons. *MERLOT Journal of Online Learning and Teaching* (11)2. 309-319.

Nyer, M., Mischoulon, D., Alpert, J. E., Holt, D. J., Brill, C. D., Yeung, A., Pedrelli, P., Baer, L., Dording, C., Huz, I., Fisher, L., Fava, M., & Farabaugh, A. (2015). College students with depressive symptoms with and without fatigue: Differences in functioning, suicidality, anxiety, and depressive severity. *Annals of clinical psychiatry : official journal of the American Academy of Clinical Psychiatrists*, 27(2), 100–108.

O’Sullivan, Helen. (2017). Online learning can prepare students for a fast-changing future – wherever they are. *The Conversation*. Retrieved in Apr 17, 2020, from https://theconversation.com/online-learning-can-prepare-students-for-a-fast-changing-future-wherever-they-are-80497

Pappas, Christopher. (2017). *8 Ways To Simplify Complex Concepts In Online Training*. eFront. Retrieved on May 25, 2020, from https://www.efrontlearning.com/blog/2017/05/ways-simplify-complex-concepts-online-training.html

Purandina, I Putu Yoga. (2020). 'Kreatifitas' Kunci Sukses Guru dalam Pembelajaran Daring di Tengah Pandemi Covid-19. *NusaBali.com*. Retrieved on April 18, 2020, from https://www.nusabali.com/berita/71825/kreatifitas-kunci-sukses-guru-dalam-pembelajaran-daring-di-tengah-pandemi-covid-19

Putri, Aditya W. (2020). Yang Harus Dibenahi Nadiem Jika Pembelajaran Jarak Jauh Permanen. *Tirto.id*. Retrieved on July 9, 2020, from https://tirto.id/yang-harus-dibenahi-nadiem-jika-pembelajaran-jarak-jauh-permanen-fPcm

Ratcliffe, Rebecca. (2020). First coronavirus cases confirmed in Indonesia amid fears nation is ill-prepared for outbreak. *The Guardian*. Retrieved on May 13, 2020, from
https://www.theguardian.com/world/2020/mar/02/first-coronavirus-cases-confirmed-in-indonesia-amid-fears-nation-is-ill-prepared-for-outbreak

Robiasih, H., & Lestari, T. (2020). Formative Assessment Performed by High School Teachers in the Pandemic Era. Loquen: English Studies Journal, 13(2), 80. https://doi.org/10.32678/loquen.v13i2.3557

Robinson, S., & Leach, J. (2020). Here is why you might be feeling tired while on lockdown. The Conversation. Retrieved on April 10, 2020, from https://theconversation.com/here-is-why-you-might-be-feeling-tired-while-on-lockdown-135502

Sander, Libby & Bauman, Oliver (2020). Zoom fatigue is real — here’s why video calls are so draining. TED. Retrieved on May 24, 2020, from https://ideas.ted.com/zoom-fatigue-is-real-heres-why-video-calls-are-so-draining/

Sklar, Julia. (2020). ‘Zoom fatigue’ is taxing the brain. Here’s why that happens. National Geographic. Retrieved on May 2, 2020, from https://www.nationalgeographic.com/science/2020/04/coronavirus-zoom-fatigue-is-taxing-the-brain-here-is-why-that-happens/

Strauss, Valerie. (2020). Five concerns about the mass rush to online learning that shouldn’t be ignored. The Washington Post. Retrieved on May 2, 2020, from https://www.washingtonpost.com/education/2020/03/30/five-concerns-about-mass-rush-online-learning-that-shouldnt-be-ignored/

Sundar, K. (2020, April 27). Five tips for designing materials for remote learning. ISTE. Retrieved on June 18, 2020, from ISTE: https://www.iste.org/explore/learning-during-covid-19/five-tips-designing-materials-remote-learning
University of Iowa Health Care. (2017). *How to handle fatigue*. University of Iowa Hospitals & Clinics. Retrieved on April 30, 2020, from https://uihc.org/health-topics/how-handle-fatigue

Wiederhold, Brenda K. (2020). Connecting Through Technology During the Coronavirus Disease 2019 Pandemic: Avoiding “Zoom Fatigue”. *Cyberpsychology, Behavior, and Social Networking* 23(7). 437-438. https://doi.org/10.1089/cyber.2020.29188.bkw

Winkelhaus, S., Sgarbossa, F., Calzavara, M., & Grosse, E. H. (2018). The effects of human fatigue on learning in order picking: an explorative experimental investigation. *IFAC-PapersOnLine, 51*(11), 832–837. https://doi.org/10.1016/j.ifacol.2018.08.442

Yarrow, N., & Bhardwaj, R. (2020). Indonesia’s education technology during COVID-19 and beyond. *World Bank*. Retrieved on August 8, 2020, from https://blogs.worldbank.org/eastasiapacific/indonesias-education-technology-during-covid-19-and-beyond

Zhafira, Arnidhya Nur. (2020). Paket data internet dikeluhkan mahal untuk PJJ, ini kata Kominfo. *AntaraNews.com*. Retrieved on July 28, 2020, from https://www.antaranews.com/berita/1610142/paket-data-internet-dikeluhkan-mahal-untuk-pjj-ini-kata-kominfo