Key Factors in Mitigating Online Learning Fatigue Among University Students

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Key Factors in Mitigating Online Learning Fatigue Among University Students

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Abstract

This study, conducted during the second of two semesters that were managed primarily online in 2020, sought to examine the means by which instructors can reduce the potentially harmful effects of "Zoom fatigue" on students. After a thorough investigation of current literature was undertaken, a survey was developed to collect university students' (n = 144) opinions on specific factors that have been shown to affect Zoom fatigue. The survey was administered on Google Forms and allowed students both to select an item from a multiple-choice scale and to provide a write-in answer. The results of this survey showed that several factors, including in-Zoom breaks and careful camera and shared screen use, could assist in reducing fatigue among learners in live online courses. Further research needs to be conducted, but several suggestions for best practices based on the data collected are included at the end of the article.

Keywords: Zoom fatigue, online learning, psychological variables in education

1. Introduction

The year 2020 will forever be remembered as a year in which countless thousands of educators were forced to master the world of online instruction. The coronavirus pandemic led teachers of English as a Foreign Language (EFL) courses to examine a body of research that was heretofore considered only as an ancillary part of the field. While most university instructors would be able to cite well-known articles on communicative language teaching and task-based learning and teaching, until 2020, few would have given more than a passing thought to the body of research related to distance learning and online education. The authors of this paper are no different.

One of the most notable concepts - undoubtedly a term that will forever be linked with

the novel coronavirus pandemic - to become common parlance in 2020 was "Zoom fatigue," named for the online meeting software application that experienced an explosion of use during the pandemic. Briefly, this can be defined as weariness experienced by members due to attending a live online meeting that generally involves all attendees utilizing audio and webcams. Both the leader of the meeting and the attendees are susceptible to Zoom fatigue, and numerous factors can lead to instructors and students experiencing it to varying degrees.

The current study takes stock of Zoom fatigue from the perspective of students, with the intent of determining a set of best practices for reducing it to the greatest extent possible. Current research on the factors contributing to Zoom fatigue will be examined, and the results of the survey regarding Zoom fatigue conducted by the researchers will be presented along with recommendations for mitigating it to the greatest extent possible.

Uncontrollable factors

Certain factors seem to lie outside of the hands of the instructor or meeting moderator, and naturally, factors related to the pandemic and the lack of a physical classroom are key

among these. The pandemic has led to massive increases in economic and social stress among young adults (Shanahan et al, 2020), and while instructors may be able to empathize, there are limits to how much they can affect it. Additionally, the increased level of social isolation (Usher, Bullar, & Jackson, 2020) or, conversely, a student's lack of privacy extending from attending class from home could lead to increased Zoom fatigue. Finally, physical activity has a significant effect on stress reduction (Blumenthal et al, 1990); the measures taken to ensure reduced coronavirus transmission may have lessened the number of opportunities for physical activity for students, and this lack of effective stress reduction could carry over to the online classroom.

Then, there is the issue of the online class experience itself. Ebner & Greenberg (2020) note that technical factors, such as audio lag, video lag, and interruptions in wireless internet service can lead students to feel both fatigue and frustration. Wiederhold (2020) points out that, in particular, it is difficult to replicate the perfect sense of synchronicity one would feel in a face-to-face environment; short delays in vocalizations that would be precisely timed in face-to-face communication can lead to stress and hesitation to contribute, particularly when the response is delayed as well. This lack of other non-verbal cues outside of facial cues can lead to subtle breakdowns in communication. In an online class, students might feel

dissonance between the choices of looking at their compatriots on the screen and looking directly at the camera lens, thus depriving the interlocutor of access to visual cues.

Finally, the connection between the aforementioned technology issues and other psychological variables related to sustained on-camera presence warrants mention. Fosslien & Duffy (2020) suggest that gazing directly at someone's face over a video-based internet connection for an extended period makes participants "uncomfortable and tired." Lee (2020) found several connections between the interaction style of online meetings and negative psychological effects: Audio lag potentially leads to lack of trust among members of a Zoom session. Lack of direct eye contact can lead to lack of familiarity, and the indistinguishability of mutual gaze can delay a sense of connection and engagement in the interaction. The extended time on camera, along with the ability to see oneself throughout the interaction - similar to having a mirror directly next to one's face during a conversation - leads to a greatly heightened concern with on-camera appearance. Lee (2020) concludes that all of these psychological stressors converge to provide a much lower perceived reward for engagement in online interactions. This lack of perceived reward for social effort could be a contributing factor to students' appraisal of a course; online courses are rated significantly lower on student evaluations than face-to-face classes (Lowenthal et al, 2015).

Controllable factors

In contrast to the factors mentioned above, there are certain factors over which the instructor can exert a measure of influence in the prevention of online learning fatigue. Nurieva & Garieva (2020) concluded that successful Zoom classes required consistent interaction by all participants to keep the students engaged. They advised that teachers use strict controls to maintain behaviors expected in a classroom, such as sitting at a desk (as opposed to lounging in bed wearing pajamas) and not having a smartphone nearby. In addition, they recommend that teachers prepare an assortment of stimuli to keep students on task through screen sharing: "lessons should be added with images, presentations, and illustrative materials, which activate students' attention and motivate them" (p. 445). In general, the level of instructor preparation for online classes seems to be more crucial than in a face-to-face setting; Cole et al (2019) found that a brief intervention - aka, an icebreaker - improves student engagement in online courses. A helpful way of viewing this type of intervention for online courses is to see them less as a single-day, start-of-course activity, and more of a semester-long endeavor that helps make up for the lack of extracurricular social

contact students experience.

Related to clear organization of the course, another controllable factor is meeting etiquette. Gautier (2020) lists the pros and cons of keeping cameras on during Zoom meetings. Gautier found that people are generally taken more seriously when others can see their faces and that less serious moments, which are important but more difficult to transmit over online classes than in face-to-face classes (Henderson, 2021), are better captured on camera. Additional benefits of on-camera presence is that it can foster stronger social connections due to mutually visible nonverbal communication, as well as creating a more welcome environment and more opportunities for equitable participation (Stanford Center for Teaching and Learning, 2020). However, Gautier also points out that longer meetings – especially those with technical problems - can make the entire session seem "awkward or unnatural." Thus, an instructor needs to consider the length of a meeting more carefully than a face-to-face class. A final consideration regarding meeting etiquette is simplicity. Fosslien & Duffy (2020) suggest that instructors avoid situations requiring multitasking; keeping messaging simple will alleviate a measure of fatigue. Fosslien & Duffy also emphasize that reducing onscreen stimuli – like cluttered backgrounds – can help participants to stay focused.

An important consideration when employing group work in online learning is the use of what is most commonly known as a breakout room, during which the instructor places students into groups of smaller sessions. Unlike a physical classroom, in which an instructor is able to overhear different groups simultaneously, the instructor cannot listen in on the breakout room without becoming an observable member. As the instructor cannot control the flow of the activity - or the language in which it is conducted - in a breakout room without directly participating in the group, this must be controlled via extensive scaffolding of breakout activities (Carter & Patton, 2021). Notably, students tend to place more value on the peer-to-peer interaction they find in breakout rooms than in full-class activities such as presentations and answering in-class questions (Bollinger & Martin, 2018), which is generally the opposite of what instructors consider to be most important.

A final controllable variable in the online class, and one that might result in increased comfort and reduced Zoom fatigue, is the formation method of groups. Different instructors employ different methods of group formation, ranging from completely randomized (Liljedahl, 2016; Patton, 2021) to grouping by ability level or learning style (Adán-Coello et al, 2011; Kuo et al, 2015). For groups that are appropriately leveled - with few to no students whose aptitude is significantly higher or lower than the majority of the class - randomized small

groups can be highly effective (Patton & Tsuchida, 2021). However, in cases where the levels of students are vastly different, ability-based or even motivation-based grouping methods are potentially more beneficial (Tuke, 2020).

EFL instruction in Japanese universities: Factors that reduce fatigue

Here, we can connect the above research on online courses to existing EFL research on face-to-face classroom environments. One key point in avoiding any type of learner fatigue is ensuring engagement in the class (Kahu, 2013). Bollinger & Martin (2018), in their development of an instrument known as the Online Engagement Strategies Questionnaire (OESQ), considered the seven main factors in engagement in undergraduate classes laid out by Chickering & Gamson (1987), which they contend apply equally appropriately to online education: increased contact, cooperative work, active learning, timely feedback, time requirements, high standards, and individualization. We have seen similar emphases placed on these factors, particularly active learning and cooperative work, in language teaching literature (Gardner, 1985; Dörnyei, 2001).

Engagement can also be achieved through the construction of positive attitudes towards the language course (Gardner, 2010), and it can also be affected by an overall positive feeling among class members about the class atmosphere (Clément, Dörnyei, & Noels, 1994). Clément, Dörnyei, & Noels go so far as to say that this feeling of shared goals and camaraderie, which EFL researchers label using the social psychological term group cohesion, can increase motivation, decrease anxiety, and promote interaction. Group cohesion can be promoted by the instructor in a number of ways, including effective scaffolding of tasks that can then be further "peer scaffolded" in smaller groups (Nunan, 1994; Ellis, 2003). These tasks can lead to a sense of classroom unity, which in turn can increase engagement and reduce fatigue. Peer scaffolding is an important concept to bear in mind with Breakout Rooms. Additionally, related to the previous section on controllable variables, the establishment of clear norms and course objectives can lead to greater group cohesion (Dörnyei & Ushioda, 2011). Dörnyei & Ushioda add that efforts to create group cohesion by the instructor that are visible to students can have the net effect of improving class members' perception of the group, and there is no reason to doubt that these efforts would not be appreciated online as well as face-to-face.

So, how can EFL instructors reduce fatigue and increase engagement in online courses? Recent research suggests that minimizing discomfort with the format, increasing

engagement, and establishing group cohesion can all be contributing factors. Ng (2020) points out many factors that contribute to stress and fatigue in online classes: On both the teachers' and students' parts, the increased scrutiny one can feel on camera can lead to increased stress. Additionally, for teachers, the aspect of on-camera instruction in which students look away from the camera and towards the other members on screen tends to appear rude or inattentive. Carter & Patton (2021), in a survey of Japanese university instructors, found that instructors who felt they had established a positive and empathetic presence found more success creating cohesive, engaged groups. Particularly in the case of Japanese learners, instructors must be prepared that the frustration they feel by lack of voluntary student participation in L2 classes, an issue that stems partially from a different classroom conduct philosophy from that anticipated under the communicative language teaching method (Miller, 1995), specifically one that focuses more on cooperation, respect for the instructor, and not challenging perspectives based on the potential to cause the instructor or other students embarrassment (Butler, 2011), might be exacerbated by the strain of on-camera instruction. Importantly, though, when executed well, students in online classes have the potential to outperform those in face-to-face classes: "Despite certain drawbacks, videoconferencing can be deemed a convenient tool to motivate students to build up their confidence, negotiate meaning and construct knowledge, thereby enhancing their communicative competence." (Vurdien, 2019)

Current study

Most of the aforementioned research lacks a vital component: The perspectives of students experiencing online instruction for the first time during a pandemic, particularly how online learning fatigue is affecting them and what they believe instructors can do to minimize that fatigue via classroom practice. Thus, this study asked students to consider several of the factors mentioned above, take into account the measures that were taken to reduce their fatigue, and rate what was most and least effective for them.

2. Method

The brief survey reported here sought to examine Japanese university students' perspectives regarding certain factors that could potentially mitigate online learning fatigue. It was conducted at a large foreign language-centered Japanese university, with approximately

13,000 students spread across two campuses. During the spring semester and the first 10 weeks of the fall semester of 2020, all classes were conducted online using a combination of Zoom online meeting software and Blackboard online learning management software. 144 respondents from both campuses participated in the study, which was conducted during the midterm period - approximately the eighth of 15 weeks - of the second semester of online instruction. Among the students, 58% were first-year students at the larger of the two campuses (henceforth, Campus A), while 42% were first- to fourth-year students at the smaller campus (henceforth, Campus B). The university levels students based on English proficiency examinations, and all the students surveyed were members of high-level groups. The survey was conducted at approximately the midterm point of the fall 2020 semester, after students had experienced online learning for one and a half semesters.

Due to restrictions on campus entrance, the survey was administered online, anonymously, through Google Forms. Students were informed that the survey would be used both for improvement of the course and to contribute to the body of research regarding online education. The survey was administered in English, although students were allowed to answer open-ended questions in either English or Japanese, and although Zoom fatigue was a primary point of interest for the researchers, the survey also asked several other questions related to issues such as online learning satisfaction and method of conducting the class.

Students at Campus A were provided a small number of bonus points as inducements to complete the survey, while students at Campus B were given a small amount of class time. Based on the surveyed courses, the response rate was approximately 74% among the first-year students at Campus A and 77% among the students at Campus B.

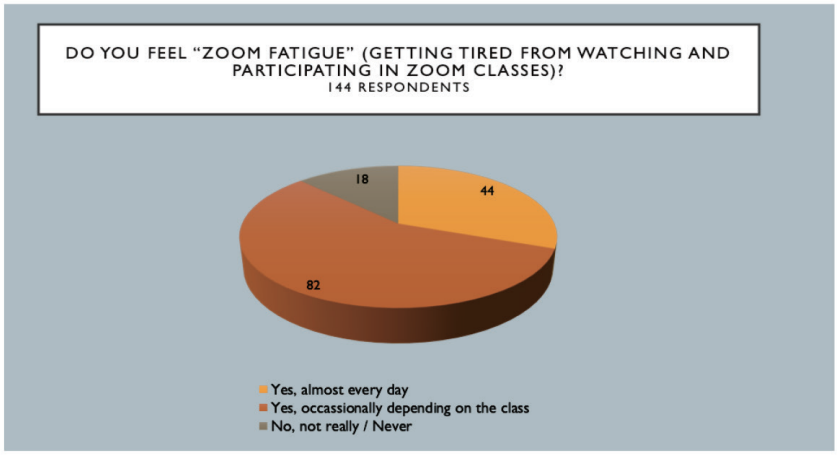
3. Results

Results will be delineated based on individual survey items:

Question 1: Do you feel "Zoom fatigue" (getting tired from watching and participating in Zoom classes?

The first question on the survey was a basic question asking students to share the frequency of Zoom fatigue they experienced. Results can be seen in Figure 1 below:

Figure 1: Student rating of Zoom fatigue



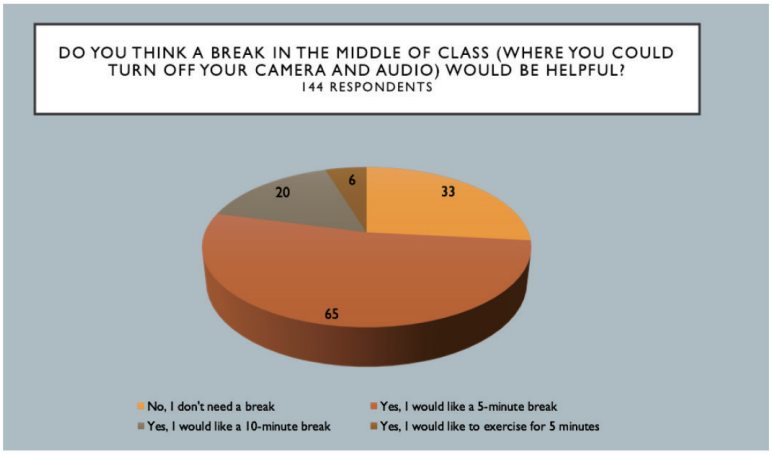
Note that "No, not really" and "Never" were two separate items on the original 4-point item. The mean score on this item when coded as a 4-item Likert scale was 3.16, with a standard deviation of .686, with the high number indicating that a large number of students experienced Zoom fatigue. From pure item response percentages, it is evident that students overwhelmingly said they felt fatigue either "every day" (44 respondents, or 30.6%) or "occasionally depending on the teacher/class" (82 respondents, or 56.9%).

Question 2: Do you think a break in the middle of class (where you could turn off your camera and audio) would be helpful?

One factor considered for reducing Zoom fatigue was the inclusion of a break during a live online meeting. To be fair, this is a question that could have easily been asked pre-pandemic, but we felt it to be especially pertinent amidst the transition to online courses. 42% of the students were enrolled in courses from an instructor that consistently provided a 5-minute break during each 90-minute Zoom session. Even with a short recess, most of these students felt they still had some fatigue. However, many of them volunteered comments in the open-ended section of the survey that the break was beneficial, including: "Break time is good. I can concentrate on classes more" and "Break time during the classes is so good because I feel tired to look at computer screen for a long time."

Figure 2 (below) shows the results of the second item, related to the inclusion of breaks:

Figure 2: Inclusion of breaks during class

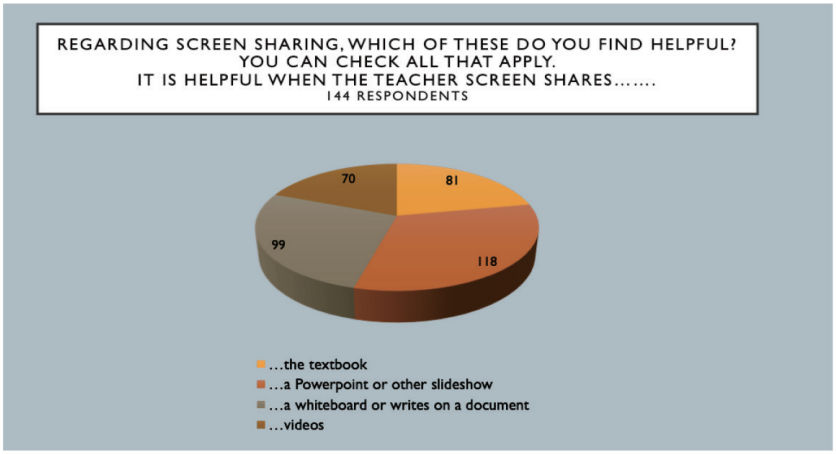


Note that the item "I would like to do an exercise routine for five minutes" was included for levity. When asked specifically about the length of the breaks where they could turn off their cameras and step away from their devices, the majority were in favor, with 65 students (45.1%) saying a five-minute break was ideal; 20 students (27.8%) felt ten minutes were preferable. However, nearly a quarter of the students, (33 students, or 22.9%), said a break was not necessary.

Question 3: Regarding screen sharing, which of these do you find helpful?

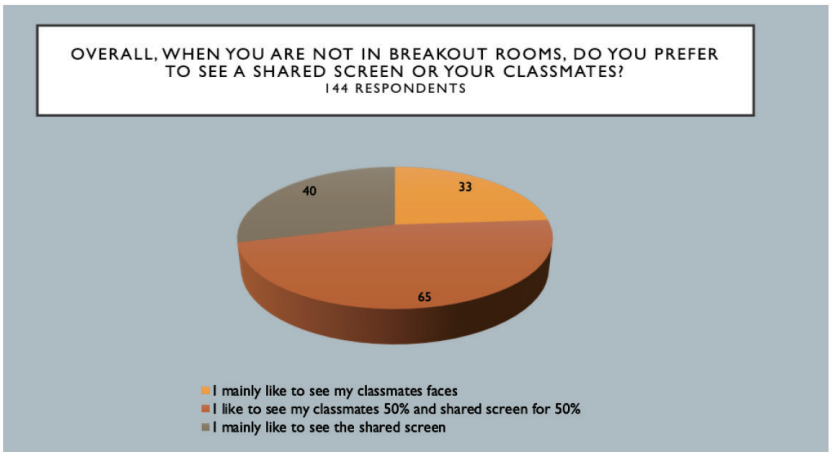
One suggestion for reducing Zoom fatigue is the use of "Screen Sharing" - displaying presentation slides, documents, whiteboards, etc, as an alternative to simply seeing the instructor and classmates - to activate students' attention and motivation (Nurieva & Garaeva, 2020). Results can be seen in Figure 3 below. A great majority of students agreed that screen sharing was helpful when the teacher shared Powerpoint slides (118 students, or 81.9%), shared the textbook (81 students, or 56.3%), or wrote on an electronic whiteboard or typed onto an empty document file (99 students, or 68.8%). These numbers varied significantly based on the format of the class and the instructor's use of online tools.

Figure 3: Screen sharing utility during class



Although the students felt that the screen sharing by the instructor and other students in breakout rooms was beneficial, we wanted to get a better idea of the degree of their feelings. This information is displayed in Figure 4 below. When asked, the majority (65 students, or 58.3%) said that they preferred to see both texts and faces during a Zoom meeting. Only 40 students (24.3%) said they solely wanted to see a shared document, compared to just 33 (17.4%) who wanted to see only faces.

Figure 4: Content or faces on-screen

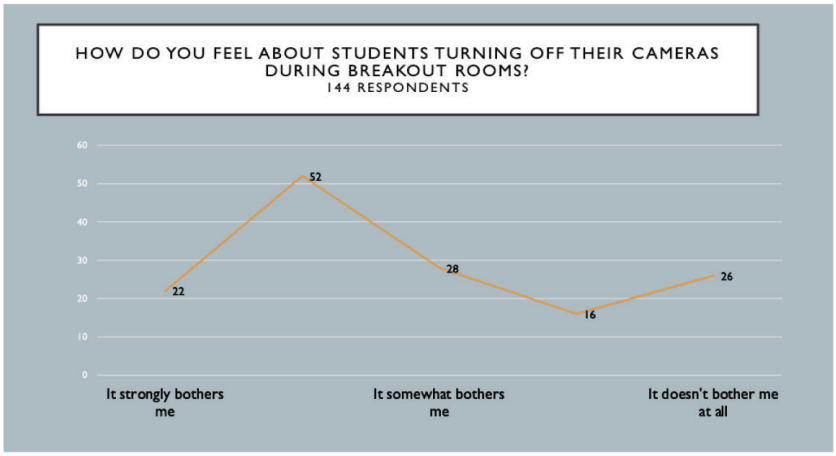


Experts are mixed on whether students' showing their faces can enhance or hinder efforts during a synchronized online class. Some students feel stress by showing their face or dealing with distractions in the home environment during a Zoom meeting (Lee, 2020). At the same time, communication involves more than just words or a person's voice. As mentioned in the introduction, seeing facial reactions can also provide the listeners with clues to what someone is expressing (Gauthier, 2020). Our survey found distinct reactions based on whether a person was in a small group or breakout session compared to a large group class session.

Question 4: How do you feel about students turning off their cameras during Breakout Rooms?

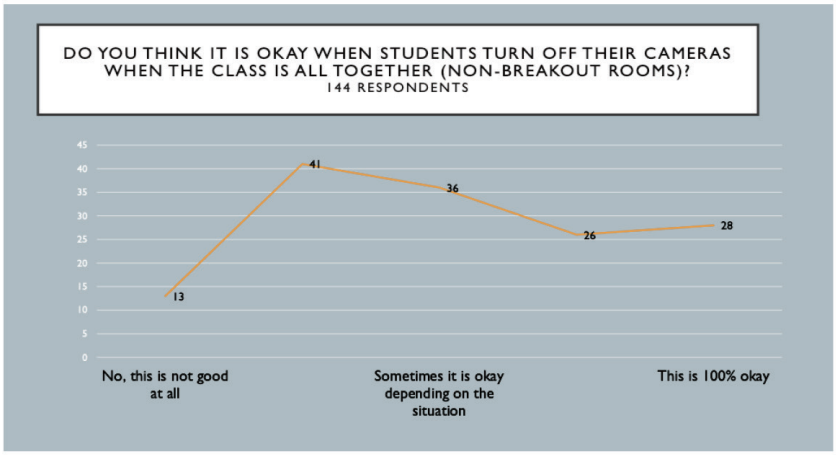
Results from this question can be seen in Figure 5 below. When asked specifically about how it feels when your partner does not use his or her camera in a small-group breakout session, 74 students (51.4%) said it bothered them not to see their partner's face, compared to 45 students (29.2%) who said it is not a concern. 28 students (19.4% of the respondents) were neutral.

Figure 5: Camera requirement during breakout sessions



The sentiment about showing faces was significantly different when asked about whether cameras should be turned on when the entire class is together. This can be seen in Figure 6 below. An equal number expressed a preference for keeping cameras on (54 students, or 37.5%) as those who felt it was okay to keep the camera off (54 students). 36 students (25%) expressed a neutral opinion.

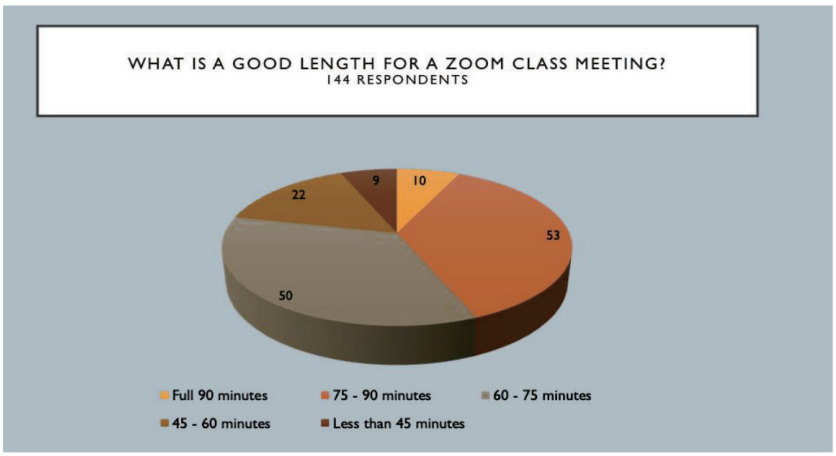
Figure 6: Camera usage during whole-group meeting



Question 5: What is a good length for a Zoom class meeting?

Results from this question can be seen in Figure 7 below. When asked about the ideal length of a Zoom class, the responses varied widely, with the vast majority of respondents expressing that they would prefer the class to last 60-75 minutes (50 students, 34.7%) or 75-90 minutes (53 students, or 36.8%).

Figure 7: Ideal length of class meetings



Again, it is unclear whether this result would vary were it asked pre-pandemic, but in this survey, it is clear that with engaging and well-planned activities, 60- to 90-minute class meetings do not seem to be too long for most motivated learners. However, even

with diligent students, consideration of Zoom fatigue is important when preparing a class especially in regard to the length of teacher talk, break-out sessions, and a break to offset the problems of weariness from online learning.

4. Discussion

The previous survey provided students not only with a series of multiple-choice questions that could be used to gauge the average sentiment of students, but also the opportunity to answer many open-ended questions. The hope is that, based on the results from the scaled items and the open-ended statements, and when coupled with the existing research on the subject, a set of best practices for reducing Zoom fatigue among online learners can be determined. From this study, we could conclude that several factors in particular led to a mitigation of Zoom fatigue more effectively than others, and we have organized them by the following categories:

1. **Including breaks and other non-camera time:** This seemed to be the most powerful factor in reducing Zoom fatigue. As reported above, the vast majority of students preferred a break during the class; we inferred that this allowed them a brief respite from the pressure of the online learning environment, and additionally, allowed them a chance to stand up and move around a bit. In addition to breaks, the majority of students stated a desire for Zoom classes not to continue for the full length of a typical Japanese university *koma* (one meeting of one course), with the majority stating that they would prefer an online class length of 60 to 75 minutes. Finally, although it is highly dependent on the content of the class, many students seem attracted to the prospect of a mixture of live, synchronous classes and on-demand or asynchronous lessons. This final factor might be difficult to implement in a course that relies heavily on speaking skills, but for writing- or reading-centered courses, it might be in the instructor's interest to hold half the classes live and the other half asynchronously, with previously recorded lessons or other content that does not require a live on-camera presence.
2. **Setting expectations regarding camera use:** There is no getting around the fact that not everyone is fond of being on camera, and, as explained in the introduction, many students (and instructors) feel a heightened sense of concern over appearance compared to that felt during face-to-face, physical meetings. This feeling,

unfortunately, tends to be exacerbated by other students' refusal to turn on their own cameras in Breakout Rooms. From the available research, we can currently recommend that a policy requiring students to leave cameras on while in small groups is crucial to the overall comfort of the members of the class. In a full-class setting, students do not seem to be as bothered by certain students deactivating their cameras; however, if the instructor is bothered by this, then that feeling of discomfort will likely be conveyed to students.

3. **Reasonable expectations for the course:** One potentially insurmountable obstacle for educators is covering the amount of material in online courses that could be covered in face-to-face courses. As mentioned in the introduction, instructors felt they had to truncate a given lesson plan's objectives significantly for online courses. If an instructor is trying to cover too much too quickly, or if an instructor expects students to be able to shift modality between types of content or task work to the degree expected in a physical class, that instructor risks contributing to online learning fatigue.
4. **Prudent incorporation of screen sharing:** Students in the current survey rated Zoom's screen sharing system highly, both for the instructor's presentation of materials and their own. Some students went so far as to say that the ability to share their own screen was the single greatest advantage of online courses. From an instructor's perspective, a mix of sharing the screen (e.g., slideshows, text documents, textbook pages, etc.) and meeting scenarios in which the instructor and all students are visible seems to have a positive effect on reducing Zoom fatigue. This could be related to the break in (1), as students can have a short amount of time where they do not have to feel concerned about their on-camera presence. On the opposite end, screen sharing for the entirety of the class or, alternatively, presenting the full class in a meeting style with all members visible can both contribute to Zoom fatigue: With the former, students seem to lose a sense of connection to the class and feel overly passive; and with the latter, students feel too much pressure to maintain a consistent on-camera presence. Thus, we can conclude that a mix of the two is ideal for minimizing fatigue with the learning experience.
5. **Highly structured Breakout Rooms:** As mentioned earlier, one of the greatest sacrifices an instructor has to make is related to the level of control over small-group activities. With the Breakout Room system, the instructor is forced to trust

that students are completing the task as it was assigned, perhaps with only a brief window during which to enter the Breakout Room and check students' progress. This lack of control can affect students as well; many reported that one of the greatest contributing factors to Zoom fatigue was awkwardness or disorganization during small-group activities. Naturally, a strong system for conducting Breakout Rooms at the beginning of the course, laid out and modeled with the full class by the instructor, can pay dividends over the duration of the course. Additionally, providing students with clear instructions and group roles before assigning them to the Breakout sessions, as well as providing an estimation of the length of the Breakout Room in advance will make students feel more comfortable during the activity itself. Students also seemed to benefit from knowing they could use the remaining time after completing their task to engage in small talk.

6. **Creative collaboration:** While this holds true in face-to-face classes in equal measure, adding occasional variety to the method of delivery and the means of student collaboration can be as helpful when paired with a meeting structure with which students can otherwise understand easily. Namely, students seemed to feel, on average, that novel activities introduced specifically for collaboration had a positive effect on their motivation and a mitigating effect on online course fatigue.
7. **Equitable, frequent, enjoyable opportunities for participation:** Stanford Center for Teaching and Learning (2020) provides in-depth lists for instructors and facilitators to create more engaging classes and meetings. Encouraging equitable participation with frequent interaction among all students can mitigate fatigue. One suggestion is for the instructor to limit the frequency and duration of his or her own responses. Additionally, designing a curriculum that empowers students to take the lead roles as facilitators in small and large groups can break the monotony of teacher-led lessons. Finally, have fun. Instructors might consider playing music before class as students arrive; having themed classes where students are encouraged to wear a silly hat or bring a pet; or sharing a favorite photo to bring a positive energy to create enthusiasm to offset routine and Zoom fatigue.

5. Conclusion

To a certain extent, Zoom fatigue seems to be unavoidable, and the tolerance to it

varies widely among individual learners. There are numerous factors that are simply out of the instructor's hands in an online setting, including equal connectivity for all learners as well as the environment, such as the home or other physical space, in which the learner is studying. However, many factors, such as meeting etiquette, level of scaffolding, clarity of instruction, and group formation method, can be influenced effectively by the instructor of the online course. When an eye is turned to utilizing those controllable factors with the goal of mitigating the damaging, motivation-destroying effects of online learning fatigue, specific, effective steps can be taken. Although more extensive research needs to be conducted on the subject, we submit that these be considered as potential best practices: including breaks during online meetings; setting clear and reasonable expectations regarding camera use; setting reasonable expectations for the level of coursework; incorporating a prudent, variegated style of screen sharing into the course; scaffolding and structuring Breakout Rooms extensively; incorporating creative methods of collaborative work; and - perhaps most importantly in a situation in which a learner might experience difficulty feeling like they are a true member of a class - ensuring that students have an abundance of opportunities for participation. If these recommendations are followed, the instructor stands a better chance of alleviating the level of Zoom fatigue experienced by the members of their classes.

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