



# Effects of changing from on-site to online distance classes on graduate students' help-seeking: lessons for sustainable teaching and learning from the COVID-19 pandemic

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## Abstract

Over the past decade, the Japanese government and Japanese universities have increased student mobility, both inbound and outbound, to accelerate the internationalization of higher education. However, student mobility was halted in early 2020 because of the COVID-19 pandemic, and international students who had planned to engage in a traditional study abroad program could not enter Japan. The current study examined whether the unexpected implementation of online distance classes because of the pandemic affected the learning strategies of graduate students, including international students. In addition, we investigated whether the online courses functioned as an alternative to face-to-face classes. An analysis using structural equation modeling revealed that the period of enrollment, self-regulation, and country of residence were factors that influenced help-seeking behavior. Graduate students who had enrolled before the pandemic and already experienced face-to-face classes were more likely to actively seek help from instructors and classmates in online classes. Furthermore, graduate students who were unable to enter the country but were taking classes online also tended to actively engage in help-seeking from their instructors and classmates. Students' experiences of the sudden change to distance learning suggest that, to ensure a sustainable teaching and learning environment in various contexts, instructors should use class designs that consider distance learning, particularly designs that enhance students' help-seeking, even under normal circumstances. In addition, ensuring sufficient online/virtual spaces for communication among teachers and students is important.

**Keywords** Self-regulated learning · Online distance learning · Help-seeking · Graduate students · Student mobility · Study abroad

## Introduction

### Impact of COVID-19 restrictions on international mobility, the internationalization of higher education (IHE), and university teaching

From early 2020, COVID-19 gradually spread around the world and became a severe global pandemic. Many countries

closed their borders to prevent the spread of infection, which led to a forced cessation of the international mobility across borders that had been progressing under globalization. This restriction on overseas travel also had a significant impact on students in Japanese higher education institutions. The globalized movement of people, products, capital, and information across national borders began to accelerate in the 1990s. With this globalization, Japanese universities advanced IHE and focused on improving student mobility, both inbound and outbound, through government subsidies. This approach was an important strategy for accelerating IHE among Japanese universities (Edwards & Ashida, 2021; Ota, 2018).

To increase inbound and outbound student mobility, the Japanese Ministry of Education, Culture, Sports, Science and Technology (MEXT) announced a plan to increase the number of international students to 300,000 by 2020, along with a policy to encourage Japanese students to study abroad. Thus, Japanese universities promoted the acceptance

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of international students and sending Japanese students to engage in traditional study abroad to internationalize their campuses. One previous survey reported that there were 312,214 international students in Japan in the 2019 academic year (Japan Student Services Organization, 2020). However, restrictions on international mobility caused by the COVID-19 pandemic meant that Japanese students who had hoped to study abroad could not leave the country, and international students were unable to enter Japan.

The pandemic also stopped cross-border movement and resulted in restrictions on inter-regional travel within countries. Many countries closed their borders to prevent the spread of the disease, disrupting the international movement of people, which had increased because of globalization. In addition to stopping cross-border movement, the COVID-19 pandemic also led to restrictions on inter-regional movement within countries. As many countries took steps to avoid overcrowding and ensure social distancing, face-to-face classes on university campuses were canceled, resulting in learning disruptions (Organization for Economic Co-Operation and Development [OECD], 2021). According to UNESCO (2021), more than 220 million students in higher education were affected by the closure of universities in 2020. Japanese universities were required to offer all classes online beginning in the first semester of the 2020 academic year, which started in April 2020. Both Japanese and international students who were already in Japan had to take classes online because they could not attend the university campus. International students who could not enter Japan were required to attend online classes from their countries of residence.

### Potential challenges for faculty and students in online and distance classes

The restrictions on domestic and international travel in response to the COVID-19 pandemic meant that students were unable to attend classes on-campus. This sudden implementation of online classes was expected to place a substantial burden on faculty members, who would be required to provide the classes, and students, who would be engaging in the classes remotely from home and abroad. Most universities in Japan had previously used traditional on-campus education methods. University statistics indicated that, as of April 1, 2020, only 6% of all universities in Japan, including public and private institutions, had a distance learning system (MEXT, 2020). Therefore, most instructors at Japanese universities were suddenly required to teach online classes, despite having no previous experience in providing distance education. Ni (2013) reported that both institutions and instructors need to pay attention to education content and design when providing online teaching, which can be a difficult task. Even under normal circumstances, many instructors were hesitant to introduce online teaching. However,

the pandemic meant that instructors were forced to provide online classes in the context of limited information and communication technology (ICT) facilities/environments, as well as a lack of experience in online teaching. Therefore, most instructors were required to completely revise their instructional approaches and materials to match the novel environment.

The switch to distance learning also had a significant impact on students' learning. Both Japanese students who expected to enroll in traditional on-campus education with face-to-face classes and international students who wanted to visit Japan to undertake traditional study abroad in face-to-face classes encountered various challenges in taking online classes. These challenges encompassed issues unique to learners as well as the problem of having to take classes in an environment with limited access to the Internet and technology.

Learners must understand and maintain their motivation to learn in both distance learning and traditional education. On the basis of this motivation, students are expected to become independent learners by overcoming disincentives to learning. That is, learners must acquire the skill of self-regulated learning, which is an effective way to become an independent learner. Self-regulated learning requires students to control and apply ideas and behaviors they generate themselves to achieve their learning goals (Schunk, 2001). A large body of research on self-regulated learning published from the 1980s to the present day has confirmed the effectiveness of this learning method for increasing learning outcomes.

The concept of self-regulated learning can be broadly applied to every level of education, particularly higher education, and previous studies have often focused on students' learning strategies (Dunn et al., 2014; Karabenik & Dembo, 2011; Kim et al., 2021). The Motivated Strategies for Learning Questionnaire (MSLQ) was developed by Pintrich et al. (1991). This Likert scale-based tool is a widely used measure of college students' motivational orientations toward lectures and classes and the use of different learning strategies. This tool may be used in both face-to-face classes and in analyses of distance learning.

Dunn et al. (2014) reported that, in an online learning environment, help-seeking was positively correlated with self-regulation and negatively correlated with students' age. Help-seeking is a self-regulated learning strategy. Many previous studies have examined effective help-seeking behaviors for achieving learning outcomes, including the help-seeking process, goal setting, and social skills training for help-seeking (Karabenik & Dembo, 2011). In asynchronous online classes, learners can decide the pace of their learning. However, this can also be a factor that prevents learners from completing their studies. Kim et al. (2021) focused on developing self-regulated learning strategies as a success factor in

asynchronous online learning and attempted to clarify how the degree of self-regulated learning strategies was related to the record of engagement in video learning and learning outcomes. In Kim et al.'s (2021) study, the MSLQ learning strategies subscale was used to measure self-regulated learning strategies in 159 learners. The results indicated that students' engagement with learning videos increased as their learning progressed, and their management strategies contributed to this upward trend. Kim et al. (2021) also revealed that increased engagement with learning videos predicted achievement of learning outcomes, and suggested the importance of student support in asynchronous online learning environments.

### Reflection on the effectiveness of distance education

Although the initial outbreak of the pandemic occurred in early 2020, some countries are still experiencing major impacts from the pandemic, and the remote delivery of classes continues, including in Japanese higher education institutions. Research on distance learning during the pandemic remains limited, but some studies have explored various perspectives regarding the effectiveness of the sudden transition to distance learning (Wut & Xu, 2021; Sobaih et al., 2020; Lei & Medwell, 2021; Cao et al., 2021). For example, Wut and Xu (2021) observed person-to-person interactions in an online classroom environment during the COVID-19 pandemic from the perspective of social presence theory. Using qualitative research methods, the researchers interviewed 17 university students and seven instructors, and reported that, in online education, interactions between students and instructors did not develop the sufficient cognitive and affective social presence.

Sobaih et al. (2020) conducted an empirical study focused on smooth communication in online education and explored the use of social media to maintain communication in developing countries. The researchers conducted an online survey and in-depth interviews, and found that there were significant differences in the use of social media between faculty and students. They found that students used social media more for interpersonal communication, whereas faculty tended to use it more for teaching and learning. Furthermore, Lei and Medwell (2021) conducted a qualitative study with 18 student teachers that focused on online collaborative learning during the COVID-19 pandemic. Their results revealed that the experience of online collaborative learning helped participants develop a diverse sense of learning and a positive view of the future use of online collaborative learning.

In a review of the possible challenges at the beginning of the pandemic in 2020 in the context of the Philippines, Toquero (2020) noted that it is important to record the impact

of the pandemic on higher education. Therefore, to clarify the impact of a sudden change in teaching methods at the individual level, the present study observed the learners' perspective and measured learners' self-regulated learning, with a particular focus on learners' help-seeking. We examined whether the sudden transition to online learning functioned as an alternative to face-to-face classes for both Japanese and international students.

### Study objective

The current study targeted graduate students to understand the influence of unexpected online classes on students' learning strategies. We also explored whether the sudden switch to online classes functioned as an alternative to traditional face-to-face instruction. Most of the targeted graduate students were international students who sought a traditional study abroad experience and expected to encounter and learn from a different culture and society through face-to-face classes and living in the destination country. This group also had a clear goal of obtaining a master's degree. Although many previous studies have focused on university students, little research has considered the influence of an unexpected shift to online classes on students' learning strategies as a temporary measure. In addition, few studies have focused on graduate students. We established the following two research questions:

- (1) What factors affect graduate students' help-seeking during the unexpected implementation of an online distance class?
- (2) How can instructors with limited resources promote help-seeking among graduate students in distance learning environments?

The current study investigated sustainable teaching and learning models during the COVID-19 pandemic period to inform preparations for unexpected future situations based on the experiences of delivering online classes in 2020 with limited facilities and resources. We used data from an online survey that targeted graduate students who had taken online classes by the end of the first semester in 2020. This study analyzed the influence of online classes on students' learning strategies based on survey results, including teachers' reflections. In addition, we proposed an evidence-based sustainable teaching and learning model for future online education.

## Research methods

### Participants and procedures

We conducted an online survey of 77 students enrolled at two graduate schools in Japan that specialized in international

**Table 1** Comparison of targeted courses

Institution type	Course I Public	Course II Public	Course III Private
Number (valid response rate)	18 (81.8%)	16 (66.6%)	17 (54.8%)
Medium of instruction	Japanese only	English, Japanese	English, Japanese
Lesson style	On-demand videos Face-to-face	Live delivery Face-to-Face	On-demand videos Live delivery
Course information	Course designed to acquire skills in Japanese speech presentation	Course goal is to acquire knowledge and skills in quantitative and qualitative research methods	Course goal is to acquire knowledge and skills in quantitative and qualitative research methods and academic writing
Course goals	Teaching materials (PDF) delivered, and students work on assignments	Designed as a mix of lectures, practice, and homework. The frequency of homework is one per 2–3 classes	Evaluation based on weekly assignments, and mid-term and final papers
Weekly assignments	Weekly assignments include 2–4 questions and the expected weekly study time is 90 min	One individual presentation is assigned during the class hour	Small group discussion arranged in online live delivery to encourage peer learning
Other specifications	Skill practice is applied in face-to-face classes Final exam is test-based and allows students to refer to teaching materials, references, and consult with classmates	Students required to work on practice individually but encouraged to work on assignments with classmates outside of class hours	Peer review work session set before mid-term and final paper submission
Similarity of teaching contents		x	x

studies or global education. School A was a public university and school B was a private university; both schools provided courses in English and Japanese. These graduate schools admit international students funded by a Japanese government-sponsored scholarship every year. In addition, both schools offer courses that follow the Japan International Cooperation Agency (JICA)-Development Studies Program, run by the JICA as part of official development assistance to other countries. Therefore, the percentage of international students is relatively high, even under usual circumstances.

In the last class of courses in the first semester in 2020, an online survey was announced for the purpose of exploring the influence of the unexpected transition to online classes on students' learning strategies. The announcement clearly explained in advance that participation in the survey was voluntary, and that whether or not students responded to the survey would not affect their course evaluation. The link to the online survey was sent out at the end of the first semester in 2020 and the survey was kept open for approximately 2 weeks. The survey was available in English and Japanese according to the language of instruction of the course. All students who had registered and in any one of three courses (Course I and II from school A and Course III from school B) received a link to the survey. All responses were anonymous. Among the registered students, only those who voluntarily agreed to participate in the survey responded; submission of a completed survey was considered to be a provision of informed consent. The details, including the teaching contents, are shown in Table 1. The number of responses (valid response rate) was 34 (71.0%) for school A and 17 (54.5%) for school B, with a total of 51 responses.

This online survey investigated the range of learning environments in students' online courses and the students' own current self-regulated learning climate. This allowed us to examine how these factors affected students' learning motivation and proactive attitudes. The questionnaire had two parts: part 1 posed fundamental questions, and part 2 explored students' self-regulation strategies. Part 1 collected the following information: age, period of enrollment, home country, country of residence, scholarship for study abroad (yes/no), work experience, device used for online classes, place of access to the online classes, medium of instruction, Internet environment, and volume of assignments in the online courses. In addition, to explore whether these sudden online classes functioned as an alternative to traditional face-to-face classes, the survey investigated changes in study hours between online classes in the first semester of 2020 and face-to-face classes in the second semester of 2019. We also asked students about perceived advantages and disadvantages of taking classes online, and their preferences for class style (e.g., on-demand, live delivery, or face-to-face).

In the second part of the survey, we used the MSLQ<sup>1</sup> to measure students' learning strategies to determine how they responded to the unexpected move to online classes. One of the most difficult aspects of learning online is

<sup>1</sup> The MSLQ scale by Pintrich et al. (1991) was developed in English, therefore this original questionnaire was used for the survey in English. For the survey in Japanese, the authors, who are native Japanese-speakers, translated the text into Japanese.

communicating with instructors and peers. In online learning environments, learners may feel lonely and lack communication opportunities (McInnerney & Roberts, 2004), especially with asynchronous distance learning. Therefore, we focused on the help-seeking and peer-learning elements of the MSLQ and sought to identify changes in these aspects.

### Measuring students' learning strategies in relation to self-regulation, peer-learning, and help-seeking

To identify students' learning strategies, we used the MSLQ self-regulation, peer-learning, and help-seeking scales. Responses are on a 7-point Likert scale (from 1 = "not at all true of me" to 7 = "very true of me"). Specific scales focused on university students' online learning have been developed, such as the Online Self-regulated Learning Questionnaire (Barnard et al., 2009) and the e-Learning Self-regulated Learning Scale in Japan. However, rather than using these measures, this study adopted the traditional MSLQ, because some target classes had returned to traditional face-to-face instruction, depending on the local pandemic situation at the location of each graduate school. In addition, the observed courses in this study were implemented with flexible changes in terms of delivery style to suit their respective conditions and situations, such as asynchronous on-demand video and synchronous live delivery.

### Constructing a prediction model for structural equation modeling (SEM)

Structural equation modeling (SEM) involves the synthesis and extension of regression analysis and factor analysis. This methodology applies testing of substantive theories from empirical data (Sinharay, 2010). In SEM, the theoretical hypothesis regarding what causal relationships or correlations exist among multiple variables can be visually represented in a path diagram. Focusing on help-seeking and peer learning, the current study aimed to clarify the causal relationships and correlations among multiple variables that may influence changes in graduate students' learning strategies in online classes, as well as the structure among these variables. Considering the advantages of SEM and this study's objectives, we employed SEM as an appropriate analytical framework to reveal students' help-seeking and peer-learning strategies.

The most obvious difference between online and face-to-face classes is the presence or absence of interactive communication among instructors and students. Compared with a face-to-face class, it is difficult for students to show help-seeking behaviors when they have questions in an online distance class. Therefore, we used help-seeking as the output of a prediction model for SEM. We also referred to the

prediction model produced by Dunn et al. (2014), which examined factors influencing the academic help-seeking of graduate students in an online course. Considering these characteristics, a prediction model was prepared as follows.

To examine respondents' characteristics, we collected information about age, and divided them into five age groups: 20–24 years, 25–29 years, 30–34 years, 35–39 years, and  $\geq 40$  years. Most respondents at both schools were aged 25–29 years; 52.9% attended school A and 76.5% attended school B. To participate in online courses, students had to be familiar with the use of the learning management system (LMS), video conferencing systems such as Zoom or Microsoft Teams, and devices such as computers and tablets. Dunn et al. (2014) reported that age influenced help-seeking behavior. Therefore, we assumed that the LMS was likely to be easier to use for younger students because they are more used to ICT tools than older age groups, and included age in the prediction model.

We also investigated the period of enrollment in the target schools. Students who had enrolled in the target schools before the COVID-19 pandemic had attended face-to-face classes in earlier semesters, and were able to interact with their classmates and professors on-campus. We assumed that it would be easier for this group to ask questions in class and work with their fellow students, even in an online environment, compared with new students. The statistical analysis revealed a difference in the entrance periods, including a significant difference in the degree of influence on help-seeking. On the basis of the assumption that the timing of enrollment would influence help-seeking, we added the period of enrollment to the prediction model.

Because of the prohibition against entering Japan during the COVID-19 pandemic, new international students could not physically participate in university life. Instead, these students attended online classes from their country of residence. Because of the differences in the Internet environment in different countries, we added variables of place and country of attending online classes into the model.

There were differences among the studied classes that went beyond the instructional content to the style of delivery (Table 2). There was no student who registered for all three target courses (Course I and II from school A, and Course III from school B). To account for differences between the classes, we added a lesson style variable to the prediction model. In addition, the target classes were offered in English or Japanese. Both of the graduate schools offered degree programs in English and Japanese. For admission to the programs in each medium of instruction, the submission of a language proficiency score<sup>2</sup> was required at the time of

<sup>2</sup> Required language proficiency score in the Japanese degree program include a certificate of N1 level in the Japanese Language Proficiency Test (JLPT) or a certificate of Japanese University Admission for International Students (EJU). For English degree programs,

**Table 2** Definition of variables

	Observed variables	Definitions and contents of observed variables
Output	Help-seeking	Even if I have trouble learning the material in this class, I try to do the work on my own, without help from anyone. (REVERSED) I ask the instructor to clarify concepts I don't understand well When I can't understand the material in this course, I ask another student in this class for help I try to identify students in this class whom I can ask for help if necessary (1 = not at all true of me to 7 = very true of me)
Input	Peer-learning	When studying for this course, I often try to explain the material to a classmate or a friend I try to work with other students from this class to complete the course assignments When studying for this course, I often set aside time to discuss the course material with a group of students from the class (1 = not at all true of me to 7 = very true of me)
	Self-regulation	During class time I often miss important points because I'm thinking of other things. (REVERSED) When reading for this course, I make up questions to help focus my reading When I become confused about something I'm reading for this class, I go back and try to figure it out If course materials are difficult to understand, I change the way I read the material Before I study new course material thoroughly, I often skim it to see how it is organized I ask myself questions to make sure I understand the material I have been studying in this class I try to change the way I study in order to fit the course requirements and instructor's teaching style I often find that I have been reading for class but don't know what it was all about. (REVERSED) I try to think through a topic and decide what I am supposed to learn from it rather than just reading it over when studying When studying for this course I try to determine which concepts I don't understand well When I study for this class, I set goals for myself in order to direct my activities in each study period (1 = not at all true of me to 7 = very true of me)
	Enrollment	Period of enrollment to graduate school (1 = April 2020, 2 = September 2019, 3 = Previous years)
	Location	Living place (1 = Japan, 2 = Others)
	Lesson style	Registered course (1 = Course A, 2 = Course B, 3 = Course C)
	Age	Student age (1 = 20–24 years, 2 = 25–29 years, 3 = 30–34 years, 4 = 35–39 years, 5 = ≥ 40 years)
	Medium of instruction	1 = English, 0 = Japanese
	Institution type	1 = public, 0 = private

the admission application. Because the target students in this study passed the admissions screening and enrolled, we considered that they had acquired the minimum language level required to study at a master's degree program. A significant difference was found in the relationship between the medium of instruction influence and help-seeking (10%). Therefore, we added the difference in teaching language to the model (Fig. 1).

Finally, there were significant differences between public school A and private school B in terms of self-regulation (5%), peer-learning (10%), or learning strategies (5%). Given

these differences, we also added a variable for institution type. In addition, this study aimed to utilize the variables, not to develop them. Therefore, we implemented a confirmatory factor analysis. The results are shown in Table 3. Some variables were not the appropriate goodness of fit at AVE (average variance extracted) due to the small number of items; however, the reliability of the results was generally confirmed.

## Analysis of SEM results

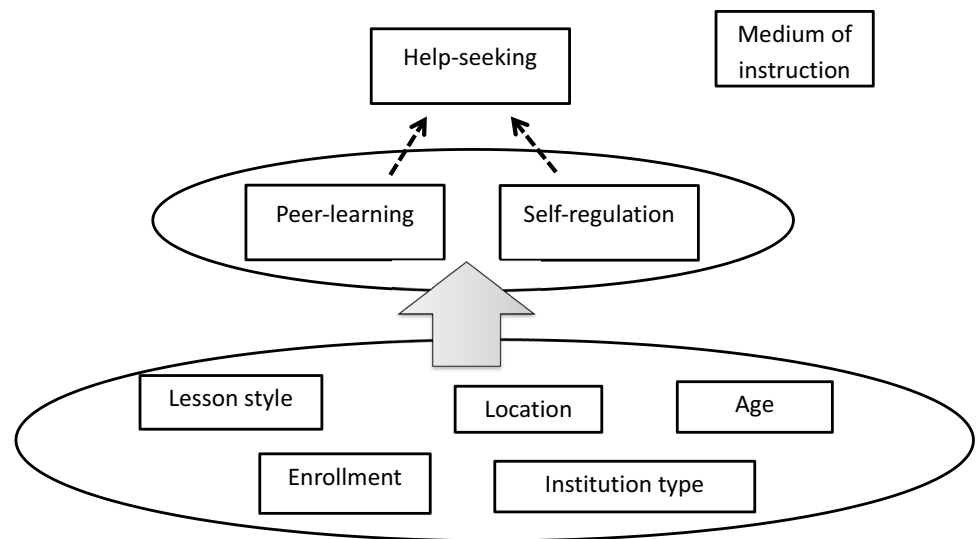
### Interpretation of model structure illustrating factors influencing students' help-seeking

We used a prediction model, conducted SEM, and examined the relationships among factors (Fig. 2). Error variables were omitted, and the path coefficients were expressed as standardized estimates. The factor loadings

Footnote 2 (continued)

students were required to submit TOEFL, TOEIC, or IELTS scores. The admissions guidelines for School A required a score of N1 or N2 level on the JLPT for the Japanese program, and a score of 60 or higher on TOEFL (iBT) or a score of 720 or higher on TOEIC for the English program. School B did not set a minimum score for language proficiency certification at the time of application.

**Fig. 1** Prediction model for students' help-seeking behavior



for the observed variables in the model were all significant at  $\leq 1\%$  (levels of significance omitted from the figure). Age, medium of instruction, and institution type (variables earlier used as tentative assumptions), did not show significant differences in the model. The comparative fit index (CFI) was 0.975, the parsimony CFI (PCFI) was 0.585, and the root mean square error of approximation (RMSEA) was 0.055.

The three variables that had the strongest influence on help-seeking were enrollment (0.34\*), self-regulation (0.28\*), and location (0.21\*). First, the path coefficient from help-seeking to enrollment was positive (0.34\*), indicating that students who had entered the graduate school before April 2020 and had attended usual face-to-face classes in previous semesters tended to seek help from their instructors or classmates.

Second, the path coefficient for help-seeking from self-regulation was positive (0.28\*), indicating that students tended to seek help from their instructor or classmates if they had high self-regulation. In addition, self-regulation showed a positive path coefficient from lesson style (0.30\*), suggesting that students' self-regulation was increased for lessons in course I or III that focused on acquiring research skills. Furthermore, self-regulation showed a positive path coefficient to peer learning (0.50\*\*). This indicated that students were more likely to exhibit active behavior and participation in discussion with classmates and engagement in class assignments if they had high self-regulation.

Finally, there was a positive path coefficient from location to help-seeking (0.21\*). This implied that students tended to seek help from their instructor or classmates if they were accessing the class from outside Japan.

### Standardized total effects on help-seeking

The total effect is the sum of the direct and indirect effects, and reflects the relative degree of influence on help-seeking in the model. Table 3 shows the total effects for all variables in the model. Enrollment had the closest causal connection to help-seeking, with a total effect of 0.34. The second-strongest causal connection was with self-regulation (0.28) (Table 4).

The mediation effect was tested using the boosted trap confidence interval method with 10,000 resamplings and bias-corrected 95% confidence intervals. By calculating a 95% confidence interval (it is not always symmetrical), a confidence interval is significant at the 5% level if it can be verified that there are no zeros in the confidence interval. Table 5 suggests that lesson style may have indirectly affected peer-learning and help-seeking through self-regulation.

### Discussion and implications for future practice

#### Relationships among peer-learning, self-regulation, and help-seeking

Peer-learning did not exert any influence on help-seeking or self-regulation; however, self-regulation influenced peer-learning and help-seeking. In addition, help-seeking was influenced by enrollment and country. In Zimmerman's (1989) model, self-regulation comprises three serial phases: forethought, performance, and reflection. Forethought takes place before performance as part of the preparation for a

**Table 3** A result of a confirmatory factor analysis

Observed variables	Standardized factor loadings	Cronbach's $\alpha$	AVE	CR	No of items
Self-regulation		0.786	0.332	0.814	11
During class time I often miss important points because I'm thinking of other things	0.070				
When reading for this course, I make up questions to help focus my reading	0.606				
When I become confused about something I'm reading for this class, I go back and try to figure it out	0.685				
If course materials are difficult to understand, I change the way I read the material	0.408				
Before I study new course material thoroughly, I often skim it to see how it is organized	0.546				
I ask myself questions to make sure I understand the material I have been studying in this class	0.759				
I try to change the way I study in order to fit the course requirements and instructor's teaching style	0.514				
I often find that I have been reading for class but don't know what it was all about	-0.033				
I try to think through a topic and decide what I am supposed to learn from it rather than just reading it over when studying	0.667				
When studying for this course I try to determine which concepts I don't understand well	0.773				
When I study for this class, I set goals for myself in order to direct my activities in each study period	0.678				
Peer-learning		0.775	0.151	0.785	3
When studying for this course, I often try to explain the material to a classmate or a friend	0.569				
I try to work with other students from this class to complete the course assignments	0.833				
When studying for this course, I often set aside time to discuss the course material with a group of students from the class	0.805				
Help-seeking		0.499	0.390	0.846	4
Even if I have trouble learning the material in this class, I try to do the work on my own, without help from anyone	0.118				
I ask the instructor to clarify concepts I don't understand well	-0.235				
When I can't understand the material in this course, I ask another student in this class for help	-0.369				
I try to identify students in this class whom I can ask for help if necessary	-1.709				
Learning strategy		0.833	0.456	0.847	18
During class time I often miss important points because I'm thinking of other things	0.12				
When reading for this course, I make up questions to help focus my reading	0.607				
When I become confused about something I'm reading for this class, I go back and try to figure it out	0.531				
If course materials are difficult to understand, I change the way I read the material	0.356				
Before I study new course material thoroughly, I often skim it to see how it is organized	0.454				
I ask myself questions to make sure I understand the material I have been studying in this class	0.796				
I try to change the way I study in order to fit the course requirements and instructor's teaching style	0.476				
I often find that I have been reading for class but don't know what it was all about	-0.076				
I try to think through a topic and decide what I am supposed to learn from it rather than just reading it over when studying	0.619				
When studying for this course I try to determine which concepts I don't understand well	0.683				

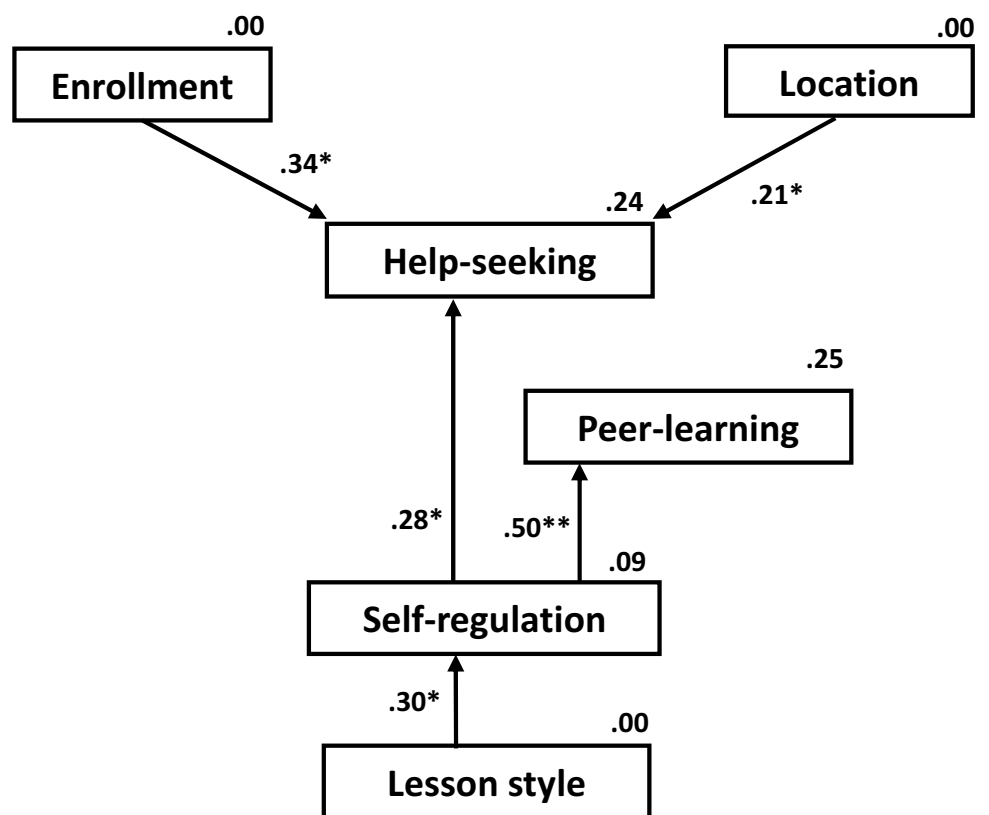


**Table 3** (continued)

Observed variables	Standardized factor loadings	Cronbach's $\alpha$	AVE	CR	No of items
When I study for this class, I set goals for myself in order to direct my activities in each study period	0.741				
Even if I have trouble learning the material in this class, I try to do the work on my own, without help from anyone	0.535				
I ask the instructor to clarify concepts I don't understand well	0.666				
When I can't understand the material in this course, I ask another student in this class for help	0.621				
I try to identify students in this class whom I can ask for help if necessary	- 0.007				
Even if I have trouble learning the material in this class, I try to do the work on my own, without help from anyone	0.583				
I ask the instructor to clarify concepts I don't understand well	0.368				
When I can't understand the material in this course, I ask another student in this class for help	0.404				
I try to identify students in this class whom I can ask for help if necessary	0.12				

CR (composite reliability)  $\geq 0.6$  (Bagozzi & Yi, 1988), AVE (average variance extracted)  $\geq 0.5$ , (Fornell & Larcker, 1981)

**Fig. 2** Results of the analysis of factors influencing students' help-seeking



CFI=0.975, PCFI=0.585, RMSEA=0.055, \*\*p<0.01, \*p<0.05

lesson on a given day. For example, the learner checks the assigned tasks and sets a learning goal. The second phase (performance) includes the implementation of learning tasks

and activities. The last phase (reflection) follows implementation, in which the learner reflects on the results of their behavior and effort. In self-regulation, the learner works on

**Table 4** Standardized total effects on help-seeking

	Direct effects	Indirect effects	Total effects
Lesson style	0.000	0.086	0.086
Location	0.208	0.000	0.208
Enrollment	0.340	0.000	0.340
Self-regulation	0.285	0.000	0.285

these three processes as an independent learner, such as setting a learning goal, implementing learning activities, and looking back on the results.

The three courses investigated in this study generally delivered weekly classes online during the semester. Considering the spread of COVID-19 in the area in which the target graduate schools were located, some classes were delivered in a mixed style, including asynchronous on-demand videos and traditional face-to-face classes. The SEM results indicated that self-regulation positively influenced help-seeking. This result was consistent with previous studies examining traditional face-to-face classes. In addition, Dunn et al. (2014) concluded that self-regulation was predictive of help-seeking. Furthermore, Cheng et al. (2013), who examined predictors of online academic help-seeking for undergraduate and graduate students, also identified self-regulated learning as one of the main predictors of help-seeking. The graduate students in this study had a clear learning objective (i.e., completing the master's course) and were independent learners, which supported their active help-seeking.

Although there was no direct relationship between peer-learning and help-seeking, a correlation was observed in the error variables. It is possible to estimate these error variables from other factors, except for self-regulation; however, we could not consider possible factors other than the variables used in this analysis and their results. In addition, help-seeking and self-regulation skills may also be influenced by the language level of individual students but were not shown as a significant model. As mentioned earlier, the target students in this analysis already had the minimum proficiency language level required for degree programs in English or Japanese, which may explain why no obvious differences were found. However, we could not examine this further from the data collected for this analysis. These limitations should be addressed in further studies.

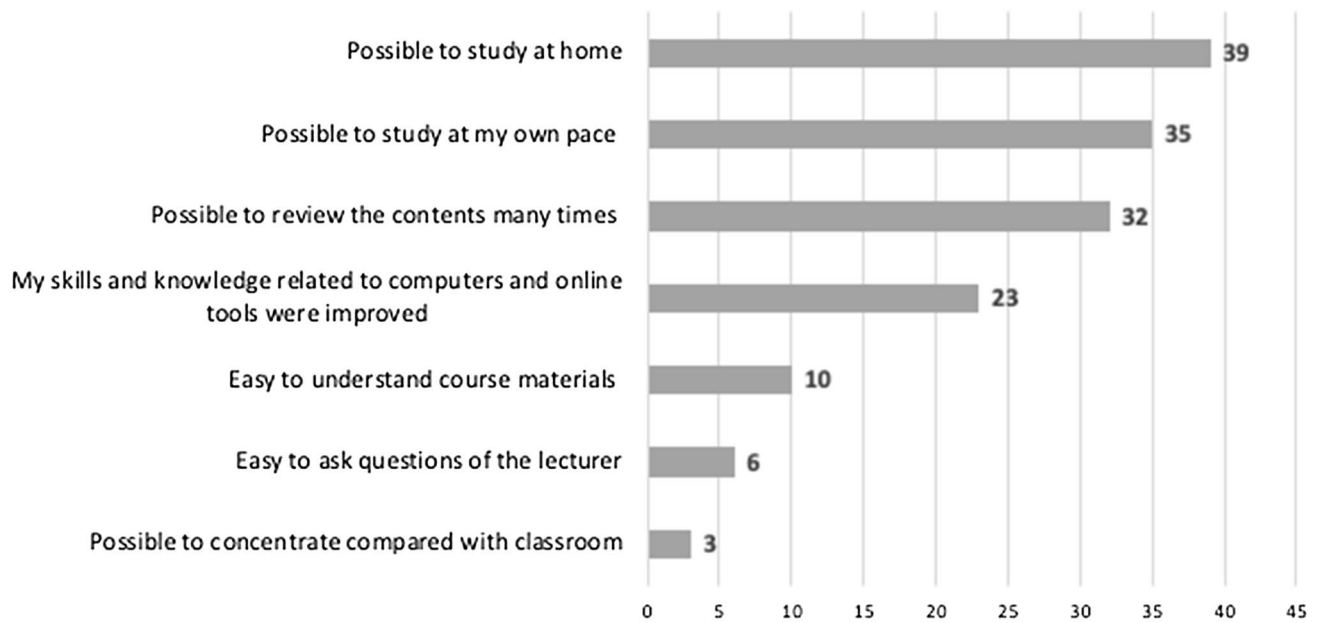
**Table 5** A result of mediation effect

	Indirect effects of lesson style	The lower limit of confidence interval	The upper limit of confidence interval	P values
Peer-learning	1.522	0.144	3.514	0.024
Help-seeking	0.803	0.073	2.390	0.023

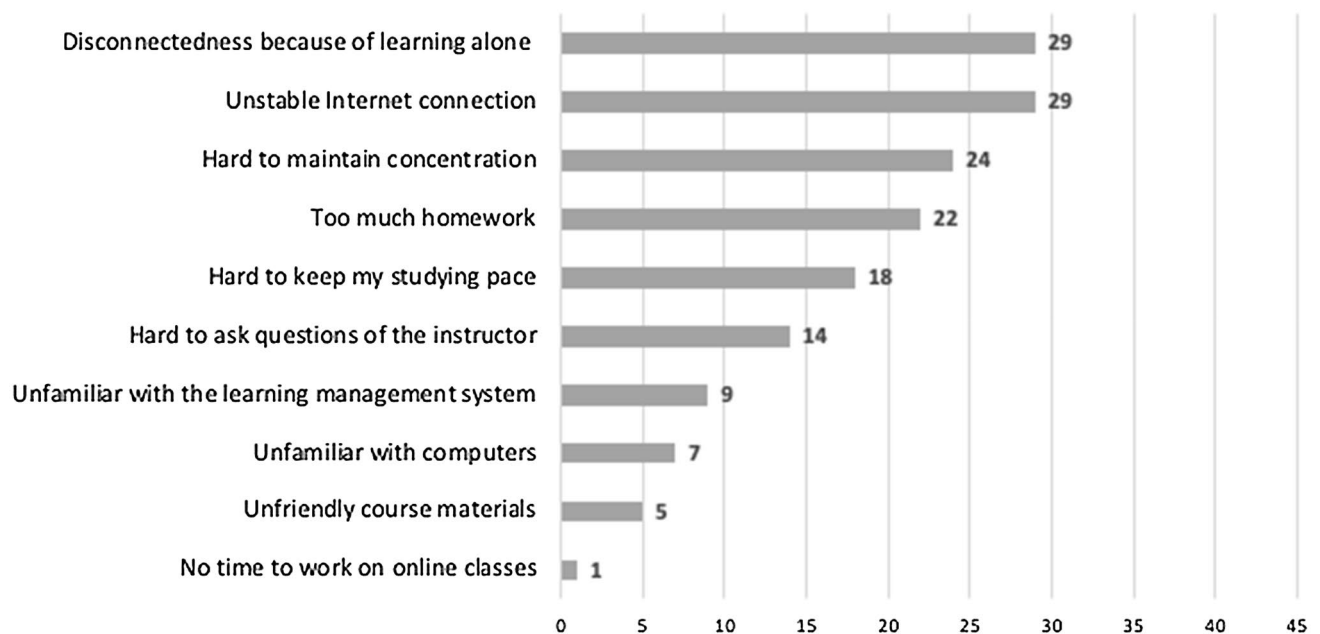
## Did the sudden transition to online classes function as an alternative to traditional face-to-face classes?

The participants in the present study were graduate students, and preferred to participate in face-to-face classes as part of traditional study abroad. Push–pull factors are often used to explain the motivations for studying abroad (Mazzarol & Soutar, 2002). Push factors are domestic factors of the home country and influence students' decision to go overseas, such as a lack of access to higher education. Pull factors are factors of host countries and institutions that are attractive to students, such as culture, the standard of living, socioeconomic status, and future career opportunities. Previous studies reported that the reasons for selecting a traditional study abroad program went beyond learning professional skills and acquiring a language, and included obtaining direct experiences to learn more about the society and culture of the destination country (Hawthorne & To, 2014; Scott et al., 2015; Jupiter et al., 2017). In Japanese universities, particularly in engineering, laboratory-based education (LBE) is a unique learning environment and has received substantial attention in human resource development in the field of international development cooperation (JICA, 2018). This laboratory culture can be experienced regardless of the student's major. For example, in social science, students belong to the laboratory of their academic supervisor, participate in seminars held regularly (approximately once a week), and independently work on their research projects through presentations and discussions with seminar members. Considering that some students hoped to study abroad onsite, including in the learning environments described above, we need to consider whether the sudden shift to online classes served as an effective alternative to traditional face-to-face classes and studying abroad for these students. To clarify this point, we asked students what they felt were the advantages and disadvantages of taking classes online. We prepared multiple choice answers and provided blank spaces for free comments.

The most commonly reported advantages of online instruction were: "Possible to study at home" ( $n = 39$ ), "Possible to study at my own pace" ( $n = 35$ ), and "Possible to review the contents many times" ( $n = 23$ ). Over 60% of participants answered this question (Fig. 3). Previous research has indicated that a variety of skills and environments are important in sustaining learning in online courses (Blackmon & Major, 2012; Brown et al., 2015; Buck, 2016; Holder, 2007; Zembylas et al., 2008). These factors include



**Fig. 3** Advantages of online courses in the 2020 spring semester as perceived by students



**Fig. 4** Disadvantages of online courses in the 2020 spring semester as perceived by students

time management skills, autonomy, and motivation to study. Participants' responses in the current survey included positive responses regarding independent learning and the continuation of learning. This suggested that online classes promoted self-learner behaviors.

Conversely, over 50% of participants noted disadvantages, including "Disconnectedness because of learning alone" ( $n=29$ ) and "Unstable Internet connection" ( $n=29$ ) (Fig. 4).

Some students also reported that it was hard to make new friends in an online class, and 47% reported that it was "hard to maintain my concentration." The learning environment has also been identified as an important factor in sustaining online learning, including the sense of belonging and community.

In an online class, communication between instructors and students generally occurs during class hours, with

**Table 6** Students' preferences for class delivery style

Which style do you prefer considering your learning and the Internet environment?	No of answers
Face-to-face class	18
Live delivery	10
Combination of live delivery and face-to-face class	9
Combination of on-demand videos and live delivery	7
Combination of on-demand videos and face-to-face class	3
On-demand videos	2
Other	1

limited opportunities outside of class. Previous studies have also reported that active communication between instructors and students using synchronous discussion forums can be effective for interaction and social presence (Buck, 2016; Gauvreau et al., 2016). To compensate for this issue, a forum space for questions and discussion after the classes was prepared in Course III. Throughout the semester, 65% of students used this forum. However, most students used this forum page for posting questions to their instructor, and little communication took place among students.

Farrell and Brunton (2020) applied a qualitative approach including semi-structured interviews to explore online student engagement experiences in Irish higher education institutions. The researchers noted that the use of discussion forums is not a panacea, given that some students are hesitant to participate and do not use them very often (Farrell & Brunton, 2020). Furthermore, Cheng and Tsai (2011) pointed out that even when many online resources for learning were provided, students were not very familiar with them and were not willing to utilize them. This conclusion was drawn from the results of an analysis during normal circumstances before the COVID-19 pandemic. However, Cheng and Tsai's (2011) results suggest several potential reasons why online discussion forums for questions and communications may not be used effectively as a place for interaction, such as students' low level of interest in, and utilization of, such online resources.

We assessed students' preferences for the delivery of future classes (Table 6). The response options were as follows: face-to-face classes, live delivery, a combination of live delivery and face-to-face classes, a combination of on-demand videos and live delivery, a combination of on-demand videos and face-to-face classes, on-demand videos, and others. The most frequently selected response was face-to-face classes ( $n=18$ ), followed by live delivery ( $n=10$ ), and a combination of live delivery and face-to-face classes ( $n=9$ ). The reasons given for selecting face-to-face classes included "It is easy to ask questions," "It is easy to communicate with classmates," and "More interactive participation

is possible." In addition, one student said "Because I am an international student, the face-to-face class helps me understand the Japanese style of education and culture." This could be a particularly important reason for international students. Students who selected a combination of on-demand videos and live delivery or face-to-face classes, and on-demand video reported two reasons for their choice: "It is possible to study at my own pace," and "It is possible to repeat a video content for review."

From the middle of the spring semester in 2020, there was an increase in assignments in online classes throughout Japan. Therefore, most Japanese universities asked instructors to consider the volume of assignments per class because each student usually registers for several courses in a semester. In the current study, we asked participants about differences in study hours and the volume of assignments compared with earlier semesters when the class was delivered face-to-face. The students reported no change in study hours. However, they felt that the volume of assignments had increased in on-demand classes, and this difference was significant. The instructors in charge of the targeted classes altered the teaching content when they shifted to the online format, but did not reduce the assignment volume. In addition, there was no mention made by the students regarding the assignments. Furthermore, the instructors noted that no particular differences were observed in students' understanding and achievements in their final evaluation.

These findings suggested that students had no particular issue with acquiring learning content despite the sudden change to an online environment. Therefore, it can be concluded that online instruction functioned effectively as an alternative to face-to-face teaching. However, it appeared to be difficult to acquire opportunities for communication with others and to obtain social and cultural experiences. Even when the space for communication on the LMS was used, most communication involved questions to lecturers regarding the class content. This implied that the sudden shift to online learning did not function effectively as an alternative for traditional study abroad.

### Implications for practice: encouragement of help-seeking in online classes

The SEM results indicated a difference in the timing of enrollment influenced help-seeking. Students who had been studying at the target graduate schools before the pandemic might already have friends in class and be acquainted with the system. Therefore, it may be easier for them to ask questions of their instructor and to work on group work with classmates, even in online classes. As of October 2021, the COVID-19 pandemic continues to impact many countries to varying degrees, including Japan, and online distance learning has continued to be widespread. We need to consider

how teachers maintain the quality of their class and encourage students' help-seeking skills by exploring sustainable teaching and learning models.

First, it is important to ensure opportunities for interactive communication between lecturers and students. It may be helpful to provide opportunities to develop a sense of collegiality. For example, using social media provides options for consciously building communities for online communication. Sobaih et al. (2020) surveyed the use of social media in online classes during the COVID-19 pandemic in 2020 by targeting Egyptian universities. Their results revealed that instructors tended to use social media with a focus on teaching and learning, whereas students used it to create spaces for online community. Therefore, to further promote communication between instructors and students, the use of social media for communication purposes other than learning should be considered. In practice, instructors tend to focus on course content and assignments from the perspective of quality. However, instructors should focus on both learning content and communication with students, particularly in the online environment. Class management with a focus on interactive communication is preferable.

Second, giving feedback on assignments on an effective schedule may be useful. In an online class, interactive communication is limited to class hours, which may seem lonely for students. In addition, students tend to expect timely responses to their online questions (Weaver & Albion, 2005). Providing quality feedback by teachers at appropriate times and frequency is necessary for encouraging and maintaining student motivation, in both online and face-to-face classes (Coll et al., 2014). Therefore, instructors should propose feedback times on the syllabus. In addition, it is recommended that a set time and place be given for communication with students.

### **Implications for practice: develop class content and teaching materials oriented toward the online class environment, and design the curriculum to enhance students' self-regulation strategies, especially help-seeking**

In the current results regarding the disadvantages and challenges related to online courses, over half of the respondents indicated that they encountered difficulty because of an unstable Internet connection. One student commented that they could access materials during the class but could not access the references shared in the class. When the pandemic occurred in 2020, universities in Japan implemented various support measures individually for students who were required to take online classes remotely. For example, a private university (school B in this study) offered financial support such as renting notebook computers and wifi routers to students taking remote classes (Waseda University, 2020). However, this support only targeted students in Japan during the pandemic, whereas students

outside of Japan could not receive this benefit. None of the students included in the current survey received this financial support. While it is possible to provide temporary support at the institutional level to improve the online environment, it is not realistic for the instructor to upgrade each student's Internet. However, instructors can prepare teaching materials and references in consideration of these limitations.

For example, it is possible to deliver course materials while reducing the volume of files to allow for access via an Internet connection with limited speed, and including materials that can be obtained online. In some Japanese higher education institutions, Massive Open Online Courses (e.g., JMOOC) have been introduced, but there was no widespread uptake before the COVID-19 pandemic. After school closures caused by COVID-19, the dissemination of these online learning systems is rapidly expanding. In addition, the use of online whiteboard tools such as Miro and Google Jamboard can help to provide interactive spaces for online classes. Many other software tool services for learning are also available, either free of charge or at a cost.

When Japanese universities were required to move from on-site to online instruction, most instructors had to revise their teaching materials. For example, many instructors used paper-based teaching materials, and these had to be changed to computer-based resources. Furthermore, copyright restrictions regarding the use of textbooks and references online became relevant. The rules for using materials have been revised, and temporary rules to respond to the emergency were established. Based on this experience and dramatic changes in the online environment in 2020, it is recommended that instructors revise teaching materials and contents to respond to online classes as far as possible, taking consideration of students in different learning environments.

Considering the diversity of students' communication skills, it may be preferable to provide multiple tools for interaction, not only a discussion forum (Farrell & Brunton, 2020). However, even if many resources are provided online, students may not actively utilize them (Cheng & Tsai, 2011). Therefore, to enhance students' self-regulation learning-related skills, Cheng et al. (2013) suggest that the curriculum should include not only goal-setting but also learning activities such as the evaluation of self-work and peer-work. Higher education institutions and instructors could design course content and curricula that enhance students' self-regulation strategies, especially help-seeking skills, rather than preparing multiple online resources.

## **Conclusions**

The COVID-19 pandemic led to school closures in 2020 at all levels of education, all over the world. Japan, which has promoted IHE on-campus by increasing student mobility,

closed university campuses, and many international students were unable to enter the country. The current study examined graduate students who selected a traditional study abroad program and hoped to complete a master's course through face-to-face classes and learn about cultural and social aspects of Japan. We examined the ways in which the sudden change to online classes influenced the learning strategies of these students.

We employed SEM with help-seeking as an output variable to examine students' learning strategies, and found three main influential variables: enrollment, self-regulation, and location. The results revealed that students who enrolled at the target graduate schools before the pandemic and had attended face-to-face classes were able to easily seek help from lecturers and classmates. In addition, students who had clear learning goals and were independent learners were able to obtain help from their lecturer and classmates. Furthermore, students who could not enter Japan during the semester and students who attended online classes from outside of Japan tended to exhibit help-seeking.

One unique aspect of this study was that we examined a population of graduate students who had planned to engage in traditional study abroad through face-to-face classes. Our findings revealed that online classes provided a suitable alternative in terms of acquiring learning content. However, online teaching was not fully equivalent to traditional study abroad, as the approach was not able to offer broader opportunities, such as communication with others and access to social and cultural experiences.

The Japanese government and Japanese universities will continue to increase student mobility to promote IHE according to globalization, although the policy target was achieved in 2019. As of October 2021, university campuses are open, and some courses are being delivered on-site or through a combination of on-site and online classes. However, there is always a possibility of a shift to online-only classes, depending on the pandemic situation. To maintain class quality and develop a sustainable teaching and learning model that promotes students' help-seeking, it is important to ensure opportunities for interactive communication among lecturers and students. It is also preferable to establish opportunities to retain or develop a sense of collegiality. In addition, giving feedback on assignments should consider the effectiveness of the timing. In an online class, interactive communication is limited to class hours, even if the class adopts real-time delivery. For teaching materials, it is preferable to prepare materials that are suitable for an online class even if classes are delivered face-to-face. Furthermore, it will be essential to design course content and curricula to strengthen students' self-regulation learning strategies, especially help-seeking. These implications are not new, but are impactful. However, it is important to consider realistic solutions, including the instructor's ICT levels in an ordinary

teaching/course delivery situation. This notion is based on the recognition that resources that an individual could not prepare themselves are not sustainable.

Finally, our results were based on a limited sample with several restrictions and a short survey time. Therefore, the results may not be representative of online class study in higher education in Japan as a whole. Because the prevalence of online classes is continuing, it would be useful for future studies to increase the target coverage and consider the relationship between peer-learning and help-seeking, which was not fully clarified in the current study.

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