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## **Preparation vs. Review: Impact of Supplemental Work in an Active Learning Classroom in Japan**

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**Abstract:** While research on active learning has mainly examined its overall effectiveness, less attention has been paid to how supplemental assignments shape learning outcomes. Using survey data from Japanese university students in case method-based International Politics courses, this study examines how pre-class reports and post-class quizzes are associated with students' self-reported gains in knowledge and skills. Ordered logit analyses show that quizzes are linked to higher self-reported gains in open-mindedness, collaboration skills, and confidence in learning, while no significant differences are found for knowledge acquisition or curiosity. Students' interest in the subject and preference for active learning are also strongly related to learning outcomes. These findings suggest that assessment design, even when considered supplemental, plays an important role in active learning implementation and should be considered alongside teaching methods.

### **Introduction**

College education today, whether in the social sciences or other fields, is expected to provide more than just knowledge. Given the highly competitive job market for high-paying positions, universities are now tasked with equipping students with a range of skills, including critical and logical thinking as well as communication abilities. Active learning has rapidly emerged as a key approach to developing these skills by placing students at the center of the learning process.

Research across disciplines and countries suggests that active learning enhances students' comprehension of theories and concepts, strengthens skills such as public speaking and intercultural communication, cultivates curiosity and motivation, and encourages political participation and civic engagement (Hettler, 2015; Ito & Takeuchi, 2022; Kenyon, 2024; Kensicki et al., 2022; Kiess, 2022; Lundberg, 2024; Rosenbaum et al., 2024).

One of the most popular active learning techniques is the case method.

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Originally developed by Harvard Business School in 1921, the case method has become a hallmark of MBA education around the world and has since been adopted across different subjects (Bayona & Duran, 2024; Mudida & Rubaii, 2017; Reed & Brunson, 2018; Schröter & Röber, 2021). It places students in the role of decision-makers, requiring them to analyze real-world scenarios and engage in class discussions. Rather than focusing on knowledge acquisition during class time, the case method assumes that students have already prepared by reading assigned cases, conducting background research, and formulating their perspectives before engaging in class discussions (Ito & Takeuchi, 2021; Rosier, 2022; Volpe, 2015). This method is also distinguished from a case study, which is considered one of the most common active-learning approaches in Social Sciences, by following a particular process and by using 'cases' that are often narrated by protagonists and written specifically for the method (Bromley, 2013; Ito & Takeuchi, 2021; Rosier, 2022).

As the case method is increasingly used across countries and subjects, more studies have emerged to provide empirical support for its effectiveness. For example, using the case of the U.K., Rosier (2022) demonstrates that the case method is more effective in promoting knowledge acquisition than traditional lectures. Bayona and Duran (2024) examine 22 studies conducted in the U.S. and other countries, concluding that the case method

enhances knowledge, although it does not significantly influence students' learning attitudes. Bayona and Castaneda (2017) analyze business students in Colombia and find that the case method can be as effective as lectures in providing knowledge, although personal traits may mitigate the effect. Using the case of Japan, Rosenbaum et al. (2024) find that various factors, including students' learning attitudes, experiences, personalities, and course preparation, affect their acquisition of both knowledge and what Nohria (2021), the former dean of Harvard Business School, refers to as meta-skills, such as the ability to prepare, listen to others, make decisions, and collaborate.

This paper seeks to deepen our understanding of the case method-based learning by shifting attention to the role of supplemental work in such active learning environments. In research on the case method and active learning more broadly, the overwhelming focus has been on the effects of active learning itself, particularly in comparison to traditional passive learning. Although the field has expanded to address this gap by analyzing the effects of various factors on students' learning outcomes in different class settings, little systematic research has examined the influence of supplemental work specifically in classrooms using the case method. Hence, using survey data from Japanese university students enrolled in International Politics courses that implement the case method, this study investigates how different types of

supplemental assignments, pre-class reports and post-class quizzes, affect students' learning outcomes in active learning environments.

### **Literature Review**

As noted earlier, research on active learning has been predominantly focused on the effectiveness of active learning itself. The literature on the case method, in particular, also focuses on the effectiveness of the approach. This is partly because the case method is designed to assess students primarily through participation, engagement, and contributions to in-class discussions. While more traditional assessments such as quizzes and exams can be added to evaluate students' understanding of the cases and related course content, they tend not to be considered the main assessment measures for active-learning activities (Ito & Takeuchi 2021). As a result, little systematic research has examined how supplemental work or assignments shape students' learning outcomes in case-method classrooms.

Even if treated as supplemental, there are reasons to expect that these assessments may affect students' learning outcomes in active-learning settings. Studies on course assessment in broader educational contexts suggest that assessments influence students' learning behaviors and academic performance, especially when they affect final grades (e.g., Latimier et al., 2019; Machemer and Crawford 2007). A report compiled by multiple Japanese universities in 2014 also emphasized that students in active-

learning classrooms tend to focus primarily on activities that matter for their grades and invest less effort in tasks that are not formally assessed.<sup>1</sup> The report concluded that, even in active-learning environments, it is important for instructors to connect the whole learning process and every classroom activity to their grades, even if grade-oriented learning may not be ideal from a pedagogical perspective. In this sense, even when supplemental work counts less toward the final grade, it may still shape students' behavior and performance as long as it is part of the grading scheme.

A large body of research on assessment also suggests that differences in the type and timing of assessments are associated with various learning outcomes. While the literature is extensive, several examples help illustrate these patterns. For example, Yang et al. (2021) run a meta-analysis of studies on class quizzes and demonstrate generally positive effects of quizzes on achieving course learning goals. Latimier et al. (2019) compare tests administered before and after exposure to learning content and find that post-instruction testing is more strongly related to learning. Writing assignments are also commonly used as forms of assessment. Prior studies suggest that writing tasks can help students apply their knowledge and process information in a more structured way, which may in turn support classroom participation and learning (Buijs & Admiraal, 2012; Stang et al., 2016; Tewksbury, 1996). Latif and Miles (2020) compare the effects of homework and in-class quizzes and find that homework is more consistently associated with higher

<sup>1</sup>The report was published as part of a project organized by the Japanese Ministry of Education, Culture, Sports, Science and Technology in 2014. <https://www.hedc.mie-u.ac.jp/pdf/ALShippaiJireiHandbook.pdf>

exam scores, while quizzes show weaker effects. They also report variation across student groups, including differences between domestic and international students.

In sum, the existing literature has examined the impacts of various assessments across different classroom settings and suggests that assessments are important determinants of students' learning outcomes, especially when they are connected to final grades, although their effects may vary by assessment type, timing, and student characteristics. It is also necessary to consider how learning outcomes are defined in relation to course objectives. The remainder of this paper therefore contributes to the broader literature on education and active learning by providing new empirical evidence on how two types of assessments might affect different learning outcomes when they are used as supplemental components in case-method classrooms.

## **Methodology**

The research was conducted at a Japanese university that employs the case method in nearly all courses. Cases are either developed by instructors or obtained from Case Center Japan, which maintains a collection of cases from institutions worldwide. To ensure the quality of case-based teaching, the university not only offers annual training for all faculty members but also sends selected faculty members to receive direct training from Harvard Business School.

In 2024, a survey was distributed to

nearly 180 undergraduate students enrolled in International Politics courses at the end of the first and second quarter semesters. Both surveyed courses are taught by the same instructor. The same cases were used for discussion, and the course structure remained identical throughout both semesters, consisting of approximately 50% lecture components and 50% case-based discussion. Within the lecture components, some class sessions incorporated activities such as watching short clips and documentaries to deepen students' understanding of the issues discussed in the cases.

In the 7-week first-quarter semester course, the final grade was determined by class contribution (70%), measured by the quality and quantity of students' engagement in discussions, and pre-class report submissions (30%). In the 7-week second-quarter semester course, class contribution remained at 70%, while the remaining 30% was based on post-class quizzes conducted at the end of each session. For both reports and quizzes, the best four out of seven submissions were counted toward the final grade. The change in supplemental assessment was not primarily driven by research considerations. Rather, the instructor sought to address practical concerns about the uneven quality and inconsistent submission of written reports, which made it difficult to assess students' engagement with and understanding of the case materials, as well as workload considerations.

For both courses, student attendance was required, and the university had set a

strict rule that missing more than three class sessions out of seven would result in failure of the course. In addition, mere attendance was not counted toward the final grade. As such, switching from reports to quizzes did not aim to improve attendance, nor was there much room for improvement given the already high attendance rate. Hence, the main purpose was to explore whether alternative forms of follow-up activities, specifically multiple-choice review quizzes rather than pre-class open-ended reports, might help students gain a better understanding of key concepts and terms addressed in the cases, as well as the skills students are expected to develop through the case method.

The online survey, which was voluntary and anonymous, included questions on students' academic status, attitudes toward learning, coursework, personal preferences, and self-evaluation of their acquisition of knowledge and skills. A dummy question was included to ensure that students read the questions carefully and provided responses that reflected their opinions. In total, 122 complete and reliable responses were obtained. Of these, 69 responses came from the first-quarter semester, where students submitted preparation reports before class. The remaining 53 responses were from the second-quarter semester, where students took review quizzes that tested their understanding of terms and concepts covered in pre-discussion lectures and case discussions. The difference in the number of responses simply stemmed from differences in enrollment. While this course was required for students majoring in the policy management program, students had

a choice of taking this course in either the first or second quarter, and more students happened to take the course earlier rather than later. Using these data, this paper examines the impact of pre- and post-discussion assignments on students' acquisition of knowledge and skills.

The dependent variables represent students' self-evaluated levels of acquired knowledge and skills. While there is no consensus on which skills should be tested in active-learning classrooms, this study focuses on the following skills, which are expected to develop at each stage of the learning process in the case method, regardless of the type of supplemental work. These skills also correspond to some of the meta-skills described by Nohria (2021), which are discussed as central outcomes of case-method instruction.

First, students are expected to acquire knowledge related to topics in International Politics in the early stages of the learning process. Before class, students are expected to read cases and conduct relevant research. In class, they first receive lectures, including video materials, to enhance their understanding of case topics. During discussions, students are expected to develop an open mindset, which in other words refers to their ability to listen to others, and to work with others effectively. By completing the entire process, students are anticipated to gain greater curiosity about the course subject and greater self-confidence in learning. Hence, in the survey, students rated the extent to which they agreed that they had gained the following on a 1-4 scale (1 = entirely

entirely disagree, 2 = mostly disagree, 3 = mostly agree, and 4 = entirely agree): (1) knowledge, (2) an open mindset (ability to listen to others), (3) collaboration skills (ability to work with others), (4) greater curiosity, and (5) confidence in learning. Given the ordinal nature of the dependent variables, this paper uses ordered logit models to examine the effects of assignment type on these learning outcomes.

The main independent variable distinguishes between two types of supplemental assignments: preparation reports and review quizzes. This variable is coded as zero for students enrolled in the International Politics course where preparation reports were required for case-method learning and as one for students in the course where review quizzes were assigned instead.

Control variables included in this analysis are as follows. First, the “experience” variable reflects students’ year of study (freshman = 1, sophomore = 2, junior = 3, and senior = 4). Since the surveyed university incorporates the case method into many courses, senior students are expected to be more accustomed to engaging in active-learning classrooms. A review of over 100 articles on the case method by Mu and Hatch (2024) also finds that upper-year and older students tend to prefer active-learning methods over traditional lectures. Similarly, Mori (2020) reports that some students shift their preference from passive to active learning within a single course as they become more accustomed to the latter.

Second, the analysis assesses students’

overall learning attitudes using several variables. The explanatory variable representing students’ “preference for format,” namely whether they favor active or passive learning, is measured by the level of stress they feel about student-centered classrooms. Students who experience lower stress in case-method learning are expected to be more likely to develop knowledge, an open mindset, collaboration skills, curiosity, and confidence. Existing literature also suggests a relationship between stress and academic performance, although some argue that a moderate level of stress can have positive effects (Almarzouki, 2024). Finally, students with greater interest in the course subject are expected to be more motivated to learn, which may lead to better learning outcomes.

Two variables represent students’ level of preparation for the course in which they are enrolled. As noted earlier, the case method requires students to enter class with a solid understanding of the cases. As Rosier (2022, p. 3) states, “understanding is a requirement,” and the success of the case method largely depends on students’ preparation (Ito & Takeuchi, 2021; Volpe, 2015). Therefore, the level of preparation is measured through two activities: reading the case and conducting relevant research (Ito & Takeuchi, 2022). In the survey, students rated their level of preparation for these activities on a scale from 1 to 4 (1 = no preparation, 2 = little preparation, 3 = some preparation, and 4 = substantial preparation).

Finally, this analysis considers students' personal characteristics related to coursework, as previous studies indicate that personality traits can influence classroom performance (Conard, 2006; Hayati, 2021; Mu & Hatch, 2024). Bayona and Castaneda (2017) particularly note that empirical research on the case method has often overlooked the role of personal traits in learning outcomes. This paper, therefore includes four measures of students' preferences for public speaking, studying for exams, reading, and completing homework on a scale from 1 to 4 (1 = entirely dislike it, 2 = somewhat dislike it, 3 = somewhat like it, and 4 = like it very much).

## Results and Discussion

This section begins by reporting the results of two-sample t-tests, which examine whether different types of supplemental assignments are associated with differences in students' levels of pre-class preparation. The case method is often viewed as demanding for undergraduate students, as it requires students to arrive in class with a solid understanding of the cases and to be ready for discussion. For this reason, preparation reports were initially assigned in the first-quarter course to ensure that Japanese undergraduate students would engage with the case materials before class and met the expectations of the Harvard method.

Table 1 presents the mean levels of pre-class reading and research by assignment type, along with the mean differences and test statistics. In the class with preparation reports, the mean score for pre-class reading was 2.91, where the

response scale is defined as follows: 1 = no preparation, 2 = little preparation, 3 = some preparation, and 4 = substantial preparation. In the class with in-class quizzes, the corresponding mean score was slightly lower, at 2.69. Students in the preparation-report group also reported slightly higher levels of pre-class research (2.56) than those in the review-quiz group (2.38). However, neither difference is statistically significant, suggesting that students' baseline levels of preparation did not differ systematically across the two courses with different supplemental assignments.

**Table 1**

*Differences in Pre-Class Preparation by Type of Supplemental Assignment*

	Class with prep reports		Class with review quizzes		Mean Diff.	t	p
	Mean	SD	Mean	SD			
Read case before class	2.91	0.79	2.69	0.64	0.22	1.61	0.109
Conducted research before class	2.56	0.82	2.38	0.66	0.18	1.32	0.190

Table 2 reports the results of the ordered logit models, which examine the relationship between various learning outcomes and the type of supplemental assignment, along with other control variables. The proportional odds assumption was tested and not violated for any of the models, indicating that the ordered logit specification is appropriate. This assumption is important because ordered logit models require the effects of explanatory variables to be constant across different thresholds of the outcome categories. If this condition were not met, a single coefficient would not adequately represent the relationship between predictors and outcomes, and more flexible model specifications would be

necessary (Rosenbaum et al., 2025). categories. If this condition were not met, a single coefficient would not adequately represent the relationship between predictors and outcomes, and more flexible model specifications would be necessary (Rosenbaum et al., 2025).

**Table 2**  
*Ordered Logit Model Results*

Variable	Model 1 Knowledge	Model 2 Open mindset	Model 3 Collaboration	Model 4 Curiosity	Model 5 Confidence
Experience (year of study)	-0.16 (0.29)	0.24 (0.29)	0.15 (0.28)	0.24 (0.31)	-0.15 (0.28)
Preference of format	1.10** (0.34)	1.23** (0.33)	0.68* (0.32)	0.74* (0.33)	0.80** (0.31)
Interest in subject	0.52 (0.30)	0.64* (0.29)	0.65* (0.30)	1.32** (0.35)	1.01** (0.30)
Preparation (reading)	0.20 (0.39)	0.43 (0.39)	-0.01 (0.41)	0.65 (0.41)	0.57 (0.38)
Preparation (research)	-0.04 (0.37)	-0.08 (0.37)	0.46 (0.38)	-0.21 (0.41)	-0.18 (0.36)
Assignment type	0.04 (0.43)	0.91* (0.43)	1.32** (0.45)	0.82* (0.46)	0.89* (0.43)
Personality (like talking)	0.12 (0.29)	-0.11 (0.29)	0.16 (0.29)	0.33 (0.32)	-0.38 (0.29)
Personality (like studying)	0.09 (0.28)	0.33 (0.28)	0.35 (0.28)	-0.17 (0.32)	0.61* (0.29)
Personality (like reading)	0.39 (0.27)	-0.02 (0.27)	0.29 (0.27)	0.98** (0.32)	0.16 (0.28)
Personality (like groupwork)	0.05 (0.35)	0.49 (0.34)	0.51 (0.34)	0.14 (0.38)	0.39 (0.35)
Pseudo R-squared	0.17	0.22	0.22	0.31	0.24
N	114	114	113	113	114

Standard errors in parentheses/ \*\*p<.01, \* p<.05

According to Model 1, the estimated coefficient for the “assignment type” variable is positive but not statistically significant. This suggests that the type of supplemental assignment, whether a pre-class report or a post-class quiz, is not associated with a higher likelihood of reporting greater knowledge gains. Similarly, in Model 4, the estimated coefficient for the independent variable is statistically insignificant. In contrast, Models 2, 3, and 5 show positive and statistically significant coefficients for the explanatory variable at the 95 percent confidence level or higher. These results indicate that students who were required to take review quizzes at the end of class are significantly more likely to report higher levels of open-mindedness (the ability to listen to others), collaboration skills (the ability to work with others), and confidence in learning compared to students who submitted preparation reports before class.

These findings can be interpreted in light of the previous literature. As discussed earlier, studies have suggested that, whether in passive or active learning settings, students tend to focus on activities and assignments that matter for their final grades (e.g., Latimier et al., 2019; Machemer and Crawford 2007). Because of this tendency, a report from multiple Japanese universities emphasized the need to make every single activity related to students’ grades when implementing active learning. The empirical results here seem to reflect this exact point. Because 30 percent of students’ final grades in the quiz-based class stemmed from post-class review quizzes, the entire in-class process of the

case method, which mainly included lectures and discussions in the surveyed courses, became relevant to their grades. In other words, students who took quizzes paid more attention to lectures and discussions than students who submitted reports before class, which might have resulted in higher levels of self-reported open-mindedness (ability to listen to others), collaboration skills, and confidence in learning. By contrast, students who submitted reports might have felt less need to “do their best” by paying close attention to lectures and engaging fully in discussions when pre-class reports had already been graded. To summarize, while the switch in supplemental work did not make a meaningful difference in students’ self-reported gains in knowledge or curiosity, it appears to have affected their behavior during class, which may have contributed to higher self-reported gains in three learning outcomes.

To illustrate the magnitude of these significant effects, Table 3 shows predicted probabilities of students acquiring knowledge and other skills based on two different supplemental assignments. Since Models 1 and 4 in Table 2 indicate that assignment type does not significantly influence knowledge acquisition or curiosity, the predicted probabilities for these outcomes are not reliable and are therefore not discussed further. The predicted probability that students self-evaluate the acquisition of an open mindset after taking the case-method course is 0.5285 for those assigned to take review quizzes, compared to 0.3106 for

those required to submit preparation reports. In other words, students in the review-quiz group are nearly 1.7 times more likely to report developing the ability to listen to others than those in the preparation-report group. Similarly, students in the former group are about 2.44 times more likely to report gains in confidence in learning than those in the latter group. The gap in predicted probabilities is even more pronounced for collaboration skills. The likelihood that students in the review-quiz group report gaining the ability to collaborate with others is 0.5117, whereas for those assigned preparation reports, it is only 0.2187. This<sup>2</sup>suggests that students taking review quizzes are approximately 3.7 times more likely to report improvements in collaboration skills.

Beyond assignment type, students’ overall learning attitudes emerge as key determinants of their learning outcomes. The estimated coefficient for teaching preference, measured by students’ stress levels toward the active-learning approach, is positive and statistically significant at the 95 percent confidence level or higher in all models. This suggests that students who prefer active learning over traditional lectures are more likely to report higher levels of knowledge acquisition and all other measured skills. In addition, the estimated coefficient for students’ interest in the course subject is positive and statistically significant at the 95 percent confidence level or higher in all models except Model 1, indicating that students with greater interest in

International Politics are more likely to report gains in collaboration skills, curiosity, and confidence in learning. Table 3 shows the magnitude of these effects by presenting predicted probabilities of students reporting high levels of knowledge and skills at the minimum and maximum values of learning attitudes, holding other variables at their means. The likelihood of achieving positive learning outcomes is between 20 and 100 times higher for students with the highest levels of preference for active learning and interest in the course subject than for those with the lowest levels. These findings suggest that while assignment type is associated with some of the learning outcomes, students' learning attitudes and interest in the subject play an even more significant and consistent role in shaping their whole learning experiences.

**Table 3**  
*Predicted Probabilities of Learning Outcomes by Assignment Type and Learning Attitudes*

Learning Outcome	Preparation Report	Review Quiz	Lowest Preference & Interest	Highest Preference & Interest
Knowledge	0.4800	0.4894	0.0208	0.7377
Open mindset	0.3106	0.5285	0.0087	0.7070
Collaboration	0.2187	0.5117	0.0248	0.5770
Curiosity	0.3165	0.5137	0.0072	0.7799
Confidence	0.2319	0.4238	0.0078	0.6447

The estimated coefficient for students' personal preference for studying is positive and statistically significant at the 95 percent confidence level in Model 5. This suggests that students who enjoy studying are more likely to report higher levels of confidence in learning through the case-method course. Similarly, the estimated coefficient for students'

preference for reading is positive and statistically significant at the 99 percent confidence level, indicating that students who enjoy reading are more likely to self-evaluate increases in curiosity about the subject. In contrast, the coefficients for students' preferences for public speaking and group work are not statistically significant across any of the models, suggesting that these factors are not systematically associated with learning outcomes in this context. Additionally, the estimated coefficients for course preparation level and experience with the case method, measured by students' year of study, are statistically insignificant across the models, showing that these factors do not show a clear relationship with the learning outcomes examined here.

### Concluding Remarks

This study has provided empirical insights into how different types of supplemental assignments—preparation reports versus review quizzes—are associated with students' learning outcomes in case method-based courses. Using data from Japanese undergraduate students enrolled in two International Politics courses, the analysis shows that assignment type is not significantly related to students' self-reported knowledge acquisition, but it is associated with several skill-related outcomes that are central to case-method pedagogy, including open mindset, collaboration skills, and confidence in learning. In particular, students who were assigned post-class quizzes were more likely to report gains in these areas than those who submitted pre-class reports.

The key implication of these findings is that students' engagement with the case method does not depend solely on whether they complete preparatory work before class, but also on how assessment structures shape their attentiveness and participation during in-class learning processes, a pattern that is consistent with prior studies showing that students tend to prioritize activities tied to their final grades. While pre-class reports appear to encourage engagement with case materials before class, post-class quizzes may encourage students to remain attentive throughout lectures and discussions, possibly because students cannot anticipate which aspects of the lesson will be assessed. In contrast, when grades are primarily tied to pre-class reports, students may perceive that the main evaluated task has already been completed before class begins, which may reduce incentives to remain fully engaged during discussions. In this sense, the form and timing of supplemental assignments can play a key role in shaping how students behave throughout the case-method learning process, suggesting that assignment design should be considered an integral component of active-learning implementation.

This study also highlights the importance of students' learning attitudes. Students who preferred active learning formats and expressed greater interest in the course subject were consistently more likely to report positive learning outcomes. These results suggest that instructional design and students' learning attitudes jointly shape learning experiences in case-method classrooms.

By contrast, more specific personal preferences, such as liking public speaking or group work, did not show systematic relationships with learning outcomes, nor did students' year of study or reported levels of pre-class preparation. Ultimately, these findings point to the central role of students' overall orientation toward learning and classroom engagement, rather than levels of preparation or specific personality traits, in shaping the effectiveness of case-based instruction.

There are limitations in this research, one of which is that the study was conducted at a single Japanese college where the case method is systematically implemented across courses. As a result, the findings may not generalize to other institutional settings, particularly those where active learning is less established or where cultural attitudes toward discussion-based learning differ. This analysis also relies on self-reported data, and the assessment of students' gains in knowledge and skills is therefore based on students' own perceptions rather than on objective performance measures. Simultaneously, it is important to note that self-reflection is widely regarded as a core component of active learning, and many empirical studies in this area rely on self-reported measures to capture students' perceptions of learning (Bromley, 2013; Ito & Takeuchi, 2021; Rosier, 2022; Rosenbaum et al., 2024). Moreover, an ongoing goal in this field has been to accumulate evidence from diverse national and cultural contexts in order to better understand how the case method can be adapted across educational systems (Bayona and Castañeda, 2017). In this

sense, while the present findings should be interpreted with caution, they also contribute to this broader effort by offering evidence from a Japanese classroom context. Nonetheless, this study would benefit from future research that incorporates larger samples across different settings and includes objective assessments of knowledge and selected skills.

Future studies could also extend this research in a couple of directions. First, longitudinal designs that track students across multiple semesters could provide deeper insight into how different types of supplemental assignments shape students' engagement with the case method over time, including whether the effects of quizzes or preparation reports change as students become more accustomed to discussion-based learning. Second, further exploration of blended assignment designs, such as combining preparatory reports with post class quizzes or structured reflection activities, may help clarify how different instructional tools work together to support both preparation and sustained engagement. Understanding how these components interact would be especially useful for instructors seeking to refine active learning practices in contexts where such approaches are still gaining acceptance.

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### **Data Availability Statement**

The dataset used and/or analyzed during the current study is available upon reasonable request.

### **Ethics approval and consent to participate/publication**

Prior to distributing the survey, the survey was reviewed by the Ethics Review Committee of Nagoya University of Commerce and Business, Japan. Ethical considerations were addressed, and informed consent to participate in the study, as well as consent to publish the research findings, was obtained from all participants of the survey.

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