

A Case Study of University Students' Preferences and Responses to Synchronous Online Classes, Utilizing Bayesian Statistics and Quantitative and Qualitative Text Analysis

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1. Introduction

The outbreak of the coronavirus disease (COVID-19) in 2020 had the largest impact on education all over the world and caused closures of most schools and universities. The United Nations reported in 2020:

The COVID-19 pandemic has created the largest disruption of education systems in history, affecting nearly 1.6 billion learners in more than 190 countries and all continents. Closures of schools and other learning spaces have impacted 94 per cent of the world's student population, up to 99 per cent in low and lower-middle income countries. (United Nations, 2020, p. 2)

Some countries or cities had lockdowns, and even others, which had no lockdowns, closed in-person/face-to-face/brick-and-mortar classes at school (hereafter, the term brick-and-mortar class[es] is utilized, indicating the same meaning as in-person/face-to-face classes). Distance education was started and continued at elementary, junior/senior high schools, and universities in many countries, utilizing radio, paper, TV, and online mediums. UNESCO Institute for Statistics (2020) collected information from the Member States on national education responses to COVID-19 school closures from pre-primary to upper secondary levels from April

to June 2020. It shows that (1) distance education delivery systems used and the percentages of the countries which used them varied according to the different regions (Northern Africa, Sub-Saharan Africa, Central and Southern Asia, Eastern and South-eastern Asia, Europe, and Latin America, and the Caribbean, Oceania) and different education levels (Basic, Pre-Primary, Primary, Lower Secondary, and Upper Secondary education), and (2) online mediums were the most utilized, followed by TV, paper, and radio, for upper secondary education in many regions.

In Japan, following the first wave of the COVID-19 pandemic in March 2020, the use of online and/or on-demand style classes increased suddenly and has prevailed at universities. Most universities prohibited students from commuting to their campuses or entering campus buildings to prevent them from becoming infected and spreading the infection. Additionally, the universities started offering “distance teaching/learning,” “emergency remote teachings,” or “online and/or on-demand-style classes.” As of May 20, 2020, the majority (90.0%) of the universities offered only distance teaching/learning classes, followed by those (6.8%) who offered distance-teaching/learning classes along with brick-and-mortar classes, and the others (3.1%) offered only brick-and-mortar classes (MEXT, 2020a). Online classes were mostly initiated without sufficient learning or preparation on the part of the teachers and university authorities at the beginning of the academic year (AY) 2020. Thus, teachers and students have been forced to teach and learn through trial and error.

This survey was conducted after the students had attended online classes for nearly an academic year to obtain their feedback and reflect on the online classes and schedule online and/or brick-and-mortar classes in the following AY 2021. Such online classes actually continued in the AY 2021, along with many brick-and-mortar classes in most universities in Japan (MEXT, 2021a; 2021b).

2. Literature Review

As early as March 20, 2020, when the first wave of the COVID-19 pandemic broke out and caused several lockdowns and school closures worldwide, Doucet et

al. (2020) released “an independent report on approaches to distance learning during the COVID-19 school closures” as part of the work of Education International and UNESCO. This report was written “by amassing, via crowdsourcing, research and discussions, the good practices of teachers around the world in relation to distance (remote) learning and online resources.” (p. 3) The report included the following chapters: (1) vision for education during and after COVID-19, (2) how? (distance learning challenges, pedagogical practice, teacher input), (3) Assessment in the time of pandemic (big ideas on assessments, teachers on assessment, designing for authenticity, designing for formative assessment and feedback), (4) to support parents, guardians and caregivers, and (5) resources (resources for educators, schools and systems; resources for students and parents).

In September 2020 in Japan, the Ministry of Education, Culture, Sports, Science, and Technology (MEXT) surveyed the actual situation of emergency remote teaching distance learning under the COVID-19 pandemic through 86 national universities and 51 national colleges of technology in Japan and summarized its merits, demerits, and areas of improvement and displayed several samples of educational practices (MEXT, 2020b). Additionally, MEXT (2020c), through a questionnaire, surveyed the classes at 377 universities, including colleges of technology in Japan, which responded that brick-and-mortar classes had been conducted in less than half of all the classes and listed up all of their responses to the situations of the administration of the classes (brick-and-mortar classes, synchronous/asynchronous online classes, or hybrid/HyFlex classes). Mishra et al. (2020), describing the online teaching-learning modes during the lockdown period at the Mizoram University (MZU) in India, employed both quantitative and qualitative approaches to investigate the perceptions of the teachers and students on online teaching-learning modes. They revealed each percentage of the usages of the various forms of online teaching-learning modes, such as WhatsApp/Telegram (Teachers [T] 100%, Students [S] 100%), Email ([T] 100%, [S] 100%), MZU-Learning Management System ([T] 100%, [S] 60%), Zoom/Cisco Webex/Google Meet/Skype ([T] 45%, [S] 15%), and Google classroom ([T] 32%, [S] 20%). Furthermore, they

revealed the perceptions of the teachers and students on online teaching-learning, especially their perceptions of its necessity and importance during the COVID-19 pandemic. Teachers and students agreed that there is no alternative to online education during the pandemic.

Several surveys on emergency remote teaching/learning (synchronous/asynchronous online classes) were reported after the year 2021 during which this survey was conducted. Imamura (2021) surveyed 33 female freshmen at the Department of Japanese Language and Japanese Literature on English lessons they took in a distance-learning style (mixed with synchronous online and on-demand) for the first semester (15 lessons) and at brick-and-mortar classrooms for the second semester in the AY 2020; it was found that 81.5% of them preferred English lessons at brick-and-mortar classrooms. Kim et al. (2021) surveyed 128 female freshmen at the Department of English in a Women's College in Kyoto and indicated that the students' preferences for online classes were not influenced by the length of commuting time. Kim et al. (2021) and Meguro (2021) implied that L2 learners' cognitive styles affected their preferences for distance-learning (synchronous online and/or on-demand) classes. Leis and Castro (2021) reported the students' responses to remote learning where many evaluated online classes as being educationally effective overall while others did not. Irwin's (2021) study showed a statistically significant difference in the satisfaction levels between the students who had unlimited data plans and those who did not. Pokhrel and Chhetri (2021) offered "a literature review on impact of COVID-19 pandemic on teaching and learning," along with information on remote teaching/learning in Bhutan. The Japan Association for College and University Education: Research Project "Possibilities of Qualitative Research in University Education" Group (2021) surveyed and described the university students' online learning by adopting a qualitative approach; one of the studies enclosed in it, Uehata (2021), surveyed the student preferences toward online, hybrid, HyFlex, or brick-and-mortar teaching/learning in different styles of the university subjects; it indicated that online teaching/learning were more preferable only in lecture-style subjects, and brick-and-mortar teaching/learning

were more preferable in other subjects, such as seminars, experiments, practical training, skills practice, and studying abroad.

However, little is known about whether the student preferences in university classes specific to English teaching/learning as a foreign language are affected by the students' attributions (different school years, sex, and commuting time) and their English abilities. Thus, it was necessary to obtain the students' responses to these hastily-adopted brand-new styles of teaching/learning to make the necessary improvements. Consequently, this study, after nearly a year of academic learning, investigated the students' preferences and responses to synchronous online classes especially related to English teaching/learning as a foreign language through a questionnaire at the Department of English, School of Letters, where the students take a variety of English classes. It examined whether the student preferences were affected by different school years, the content of the classes, sex, commuting time, and English abilities.

3. Method

3.1 Purpose

The purpose of this study is to examine the university students' preferences and responses for synchronous online classes during the COVID-19 pandemic by administering a questionnaire, so that we can see whether the student preferences were affected by different school years, the content of the classes, sex, commuting time, and English abilities.

3.2 Participants

A total of 157 freshmen, 143 sophomores, 140 juniors, and 164 seniors who studied at the Department of English, School of Letters, a private university located near Tokyo, were asked to participate in this survey on a voluntary basis through e-mails delivered to them twice in December 2020. Fifty freshmen (31.8%), 30 sophomores (21.0%), 40 juniors (28.6%), and 27 seniors (16.4%) participated in this survey, totaling 147 (24.3%) students. As a general trend at the Department, the

first-year students have to take many classes, almost all of which are required for graduation. The second-year students need to take a slightly fewer number of classes, many of which can be selected for their graduation. The third-year students take even fewer classes, most of which are preferential; however, they are required to take Seminars 1 and 2, in which they start their research for the graduation thesis for the next academic year. The fourth-year students are required to take Seminars 3 and 4 and Research for Graduation Thesis, but they either take a few more classes or none.

The students took online classes for almost one academic year (AY 2020), which consisted of two semesters, and where one class included 15 ninety-minute lessons per semester. According to the new but temporal class administration policy that this university suddenly implemented in April 2020 to tackle the spread of the coronavirus, only synchronous online-style classes, which students had to attend during the same period of the same day on a regular basis, were allowed to be taught. On-demand-style classes that students could take online at any time according to their conveniences and preferences were not allowed. Additionally, this university started to utilize Google's G Suite for Education as a learning management system (LMS). Teachers and students utilized the online classes, especially relying heavily on Google Meet (online video conference system) and Google Classrooms. In the initial stage of the synchronous online style classes, a few students did not have their own personal computers, and they had to use their smartphones. However, their plans with smartphone carriers were, in many cases, restricted to 50 GB/month with special prices and offered under the special circumstances of the COVID-19 crisis. Considering these limitations, the university directed its teaching staff to use Google Meet for a minimum time with the cameras switched off and asked the students to spend more time in learning through the tasks given by the teachers in Google Classrooms, so that the communication traffic volumes would not increase rapidly. Soon (May to August with emergency school closure in April, AY 2020), almost all students had their own personal computers with broadband communication traffic volumes enabled, and teachers were allowed to utilize Google Meet for as much

time as they deemed necessary.

3.3 Materials

The questionnaire was in Japanese and utilized Google Forms, a free Internet application to administer questionnaires, after e-mails requesting participants to fill out this questionnaire on a voluntary basis were sent to all the students at the Department twice. The purpose was to obtain the students' responses to online classes after they attended approximately one academic year (two semesters) and to provide the Department and the teaching staff with their responses as feedback, which could be used to improve the online classes in the next academic year.

The questionnaire included seven questions:

Q1. Sex

1. Male 2. Female 3. Prefer not to answer

Q2. Commuting time from your current place of residence to the university

1. ≤ 30 min, 2. ≤ 60 min, 3. ≤ 90 min, 4. ≤ 120 min,

5. ≤ 150 min, 6. ≤ 180 min, 7. > 180 min., 8. Can't commute

Q3. Preferences pertaining to brick-and-mortar or online classes for each class (Subjects A, B, C,) during the COVID-19 pandemic using a 5-point Likert-type scale

0. Not taking (that class)

1. *Strongly prefer brick-and-mortar classes on campus*

2. *Prefer brick-and-mortar classes on campus*

3. *Either is fine*

4. *Prefer online classes*

5. *Strongly prefer online classes*

Q4. Open-ended questions (free writing) on the online classes specific to English language classes

Q5. Open-ended questions on the other online classes except for English language classes

Q6. Open-ended questions on preferences pertaining to brick-and-mortar or online

classes for the next academic year

Q7. Questions unrelated to this study

Classes (subjects) that students were taking differed depending on their grades (freshmen, sophomores, juniors, and seniors); hence, the classes shown in Q3 were different. Consequently, four versions of the questionnaire corresponding to their grades were prepared with Q3 being slightly different. All the versions had a common statement as part of the informed consent: “Your responses will not affect your academic grades, and your personal information will be utilized only in statistical analyses under the manipulation for anonymity and will be protected.” Before the participants began to respond, they were also notified that their student ID number would be visible to the administrator through a Google Forms setting. This setting was adopted with no change so that the administrator (author) could be aware of the students’ grade and match their TOEIC (Test of English for International Communication) IP (Institutional Program) scores using their ID number.

3.4 Administration

All the students, except the seniors, were directed to take TOEIC Listening & Reading IP online with no extra charges, although some of the participants did not take it voluntarily. In December 2020, an e-mail was sent to all the students at the Department of English, asking them to respond to the questionnaire during a 9-day period on a voluntary basis, and the same e-mail was sent as a reminder 3 days prior to the deadline. One of the four versions of the questionnaire corresponding to the students’ grade was sent on Google Forms. A total of 50 freshmen (31.8%), 30 sophomores (21.0%), 40 juniors (28.6%), and 27 seniors (16.4%) responded with the informed consent. The responses were aggregated and matched with their TOEIC IP scores using their ID number. Subsequently, they were analyzed following the manipulation for anonymity.

The summary of the analyses and participants’ comments were shared with all the teachers at the Department of English as feedback from the students, thereby

expecting them to introspect their first-time experiences of online teaching and to consider improvements for the following semester. Moreover, implications from the students' responses were presented and discussed at the meeting under the Faculty Development (FD) Activity for the departmental staff, which was held just before the start of the classes during AY 2021. In the FD meeting, a PDF file of a paper of an educational practice, Katagiri (2021), which describes and provides examples of methods or ideas on how to teach English through online style classes, was shared with the teaching staff. The questionnaire provided the knowledge to improve their first-time online teaching experience following the Plan–Do–Check–Act (PDCA) cycle. The summary of the results of the questionnaire was provided to the participants through an e-mail, which expressed the Department's gratefulness for their cooperation, explaining that their responses will be used as feedback for all teachers to make the necessary improvements in online teaching for the following semester.

3.5 Data Analyses

In the editorial section of *The American Statistician*, an academic journal published by the American Statistical Association (ASA), Wasserstein et al. (2019) declared denial of the notions of “statistically significant” or “ $p < .05$ ” and the prohibition on utilizing their descriptions. Therefore, for the analyses of Q1, Q2, and Q3, classical statistics (frequentist approach) based on the null-hypothesis significance testing (NHST) were not utilized, but the Bayesian approach was adopted by utilizing Bayes factors (BF_{10}) estimated through the free statistical software JASP (ver. 0.15). BF_{10} implies the probability or likelihood of the alternative hypothesis (H_1) compared to the null hypothesis (H_0): $BF_{10} = BF(H_1/H_0) = (p(D|H_1))/(p(D|H_0))$. The author judged their values, following the criterion shown by Goss-Sampson (2020, pp. 39–40): “decisive evidence in favor of H_1 ($100 < BF_{10}$),” “very strong evidence in favor of H_1 ($30 < BF_{10} \leq 100$),” “strong evidence in favor of H_1 ($10 < BF_{10} \leq 30$),” “moderate evidence in favor of H_1 ($3 < BF_{10} \leq 10$),” “anecdotal evidence in favor of H_1 ($1 < BF_{10} \leq 3$),” “no evidence in favor of neither

($BF_{10} = 1$),” “anecdotal evidence in favor of H_0 ($0.33 \leq BF_{10} < 1$),” “moderate evidence in favor of H_0 ($0.1 \leq BF_{10} < 0.33$),” “strong evidence in favor of H_0 ($0.033 \leq BF_{10} < 0.1$),” “very strong evidence in favor of H_0 ($0.01 \leq BF_{10} < 0.033$),” and “decisive evidence in favor of H_0 ($BF_{10} < 0.01$).” The 95% credible intervals (CrIs) were also estimated and utilized instead of the 95% confidence intervals (CIs) of the classical statistics.

For the analyses of Q4, Q5, and Q6, text mining (a quantitative approach for the text analysis), utilizing the free computer software, KH Coder (Higuchi 2022), was conducted along with conventional analyses by way of intensive reading, extracting the representative sample responses, and summarizing (a qualitative approach). The results of the analysis of the latter (the qualitative analysis) have at times been criticized as involving the analyzers’ subjectivity; therefore, the former (quantitative approaches for the text analysis) were also conducted to add more evidence to support the results of the qualitative analysis.

4. Results and Discussion

4.1 Differences Among School Years

The number of participants, means of “means (for each participant) of preference scores for each participant (hereafter, MPSs),” 95% CrIs of the means, and standard deviations for each school year were estimated by the Bayesian approach and are presented in Table 1. Their boxplot is presented in Figure 1. When calculating MPSs in Q3, responses of “0. Not taking (that class)” were excluded so that zero would not affect the MPSs. The means were slightly higher than the middle 3.0 among the first- through third-year students; however, their 95% CrIs included 3.0 for the first- and second-year students but not for the third-year students. Therefore, the third-year students may have a slightly higher preference for online classes, but we cannot state that the first- and second-year students prefer either one. The fourth-year students took Seminars 3 and 4 (required) and Research for Graduation Thesis (required), but only a few additional classes or none, so it might have affected their tendency to prefer brick-and-mortar classes slightly more.

Second-year students took brick-and-mortar classes only during their first year, so they might not persist with brick-and-mortar classes compared to the first-year students who never took them or took one or two such classes, which were held exceptionally. The third-year students took brick-and-mortar classes for 2 years, so they might not be more persistent with these classes. We might be able to see this tendency in Figure 1. However, the result of the Bayesian analysis of variance (ANOVA) among the four school years under the prior distribution with “ r scale fixed effects = 0.5” and “ r scale random effects = 1” (default settings in JASP; hereafter, the same prior settings were adopted for all the Bayesian ANOVA) indicates that we have only anecdotal evidence that the preferences for brick-and-mortar or online classes are similar among the various school years ($BF_{10} = 0.56$). Post-hoc tests were conducted utilizing Bayesian t tests with a Cauchy (location = 0, scale = $\sqrt{2}/2 = 0.707$) prior (default settings in JASP; hereafter, the same prior settings were adopted for all the Bayesian t tests). The medians for posterior effect size estimates (hereafter, δ med) and their 95% CrIs are also described followed by BF_{10} . The results revealed that there is (1) moderate evidence that preferences for brick-and-mortar or online classes were similar between the first- and second-year students ($BF_{10} = 0.27$, $\delta = 0.10$ [-0.31, 0.53]) and the second- and third-year students ($BF_{10} = 0.27$, $\delta = 0.09$ [-0.34, 0.53]), (2) anecdotal evidence that preferences for brick-and-mortar or online classes were similar between the first- and third-year students ($BF_{10} = 0.37$, $\delta = 0.20$ [-0.19, 0.60]) and the first- and fourth-year students ($BF_{10} = 0.96$, $\delta = 0.37$ [-0.07, 0.83]), and (3) anecdotal evidence that preferences for brick-and-mortar or online classes were different between the second- and fourth-year students ($BF_{10} = 1.52$, $\delta = 0.46$ [-0.03, 0.98]). However, substantial evidence was found that preferences for brick-and-mortar or online classes were different between the third- and fourth-year students ($BF_{10} = 4.24$, $\delta = 0.57$ [0.09, 1.07]). In conclusion, preferences toward brick-and-mortar or online classes differed only for the third- and fourth-year students. Generally, fourth-year students had fewer classes, except for Seminars 3 and 4 (required), so this different learning environment should be considered.

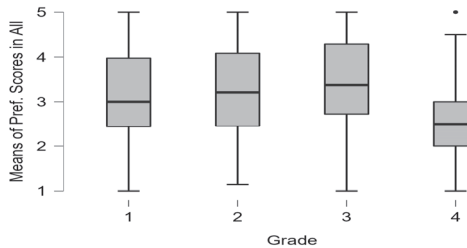
Table 1

Descriptives of Means of Preference Scores (MPSs) for Each Participant in Each Year

Grade	<i>n</i>	<i>M</i>	95% CrI		<i>SD</i>
			Lower	Upper	
1st	50	3.16	2.86	3.46	1.07
2nd	30	3.29	2.87	3.71	1.12
3rd	40	3.41	3.05	3.77	1.13
4th	27	2.71	2.32	3.10	0.99

Figure 1

A Boxplot of MPSs for Each Participant in Each Year



4.2 Differences of Class Contents

4.2.1 First-Year Students

All first-year students were taking the following classes (required): 1. Introductory Seminar to Academics, 2. Introductory Seminar to English Skills, 3. Introductory Course to English and American Literatures, 4. Introductory Course to English Linguistics, 5. English Speaking 1 & 2 (instructors were native speakers of English; hereafter, ES), 6. English Listening 1 & 2, 7. English Reading 1 & 2, 8. English Composition 1 & 2, and 9. Four-Skill Integrated English 1 & 2 (instructors were native speakers of English). The nine courses mentioned above were obligatory, which means that all students had to take them. Descriptive statistics of raw preference scores by differences of class contents are shown in Table 2.1 and the boxplot in Figure 2.1. The result of Bayesian ANOVA among the nine types of classes reveals that there was only anecdotal evidence that preferences for

brick-and-mortar or online classes differed among the students ($BF_{10} = 2.20$). Post-hoc tests, utilizing Bayesian t tests, revealed substantial evidence that preferences for brick-and-mortar or online classes differed between “3. Introductory Course to English and American Literatures” and “5. ES” ($BF_{10} = 15.3, \delta = 0.58 [0.19, 0.98]$), between “4. Introductory course to English Linguistics” and “5. ES” ($BF_{10} = 12.6, \delta = 0.56 [0.17, 0.96]$), between “5. ES” and “7. English Reading 1 & 2” ($BF_{10} = 27.9, \delta = 0.62 [0.23, 1.02]$), and between “7. English Reading 1 & 2” and “9. Four-Skill Integrated English 1 & 2” ($BF_{10} = 5.36, \delta = 0.50 [0.11, 0.89]$).

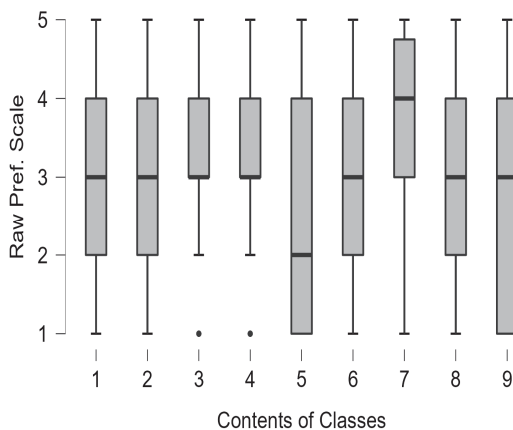
It can be noted that students were likely to slightly prefer brick-and-mortar classes for both Speaking and Four-Skill Integrated English taught by native English speakers only, but that they were likely to slightly prefer online classes for the other classes. From the participants’ comments in Q4, it can be inferred that this choice could partly be attributed to the fact that in 2020, Google Meet had not provided “breakout sessions,” in which attendees can be divided into several groups for group talks and group activities, so they could not have pair- or group-work in English. Some teachers utilized Zoom, which is equipped with breakout sessions. However, teachers and students have encountered numerous challenges in group talks and

Table 2.1
Descriptives of Raw Preference Scores by Contents of Classes
(1st Year Students)

Class	n	M	95% CrI		SD
			Lower	Upper	
1	50	3.12	2.74	3.50	1.35
2	50	2.98	2.61	3.35	1.32
3	50	3.44	3.12	3.76	1.13
4	50	3.42	3.10	3.74	1.13
5	50	2.60	2.17	3.03	1.51
6	50	3.18	2.79	3.57	1.38
7	50	3.54	3.18	3.90	1.27
8	50	3.20	2.85	3.55	1.23
9	50	2.80	2.39	3.21	1.44

Figure 2.1

A Boxplot of Raw Preference Scores by Contents of Classes (1st Year)



group activities. The participants complained that they had less opportunity to speak English in online classes and encountered lower sound quality.

4.2.2 Second-Year Students

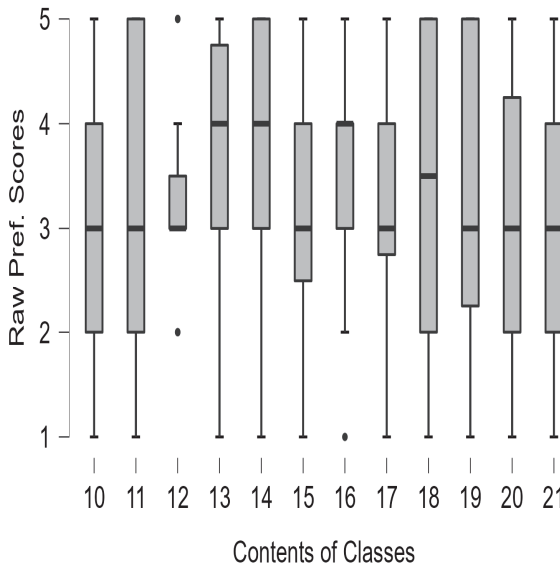
The second-year students were taking the following classes:

10. Comprehensive English 1&2 (required)
11. Speaking 3&4 (required) (instructors were native English speakers)
12. Advanced Listening 1&2 (selective)
13. Advanced Reading 1&2 (selective)
14. Advanced Composition 1&2 (selective)
15. Introductory Classes to Interpretation 1&2 (required or selective)
16. Introductory Classes to Translation 1&2 (required or selective)
17. International Understandings 1&2 (selective)
18. English Presentation 1&2 (selective)
19. English Spheres with Their Histories, Societies, & Cultures (selective)
20. Cultural Communications (selective)

Table 2.2
Descriptives of Raw Preference Scores by Class Contents (2nd Year Students)

Class	n	M	95% CrI		SD
			Lower	Upper	
10	29	3.03	2.53	3.54	1.32
11	30	3.13	2.53	3.74	1.61
12	11	3.27	2.60	3.95	1.01
13	26	3.58	3.08	4.08	1.24
14	25	3.68	3.13	4.24	1.35
15	15	3.20	2.47	3.93	1.32
16	19	3.47	2.91	4.04	1.17
17	16	3.31	2.68	3.95	1.20
18	6	3.33	1.38	5.29	1.86
19	18	3.39	2.68	4.10	1.42
20	16	2.94	2.15	3.73	1.48
21	27	3.15	2.66	3.64	1.23

Figure 2.2
A Boxplot of Raw Preference Scores by Class Contents (2nd Year)



21. Other Lectures (selective)

Descriptive statistics of raw preference scores considering the differences in the content of the classes are shown in Table 2.2 and the boxplot in Figure 2.2. The result of Bayesian ANOVA among the 12 kinds of classes shows that we have substantial evidence that preferences toward brick-and-mortar or online classes were the same among them ($BF_{10} = 0.02$). The post-hoc tests, utilizing Bayesian t tests, also revealed that preferences were similar between the ${}_{12}C_2 = 66$ pairs (BF_{10} : $MIN = 0.27$, $MAX = 0.99$). Unlike the tendency among the first-year students, the second-year students' preferences for brick-and-mortar English Speaking classes were similar to those for the other classes.

4.2.3 Third- and Fourth-Year Students

As stated in Section 3.2, the third-year students were taking fewer classes from a variety offered, and the fourth-year students were taking an even lower number of classes; thus, the numbers of respondents taking each class were too small in several classes. Analyses on the differences of class contents are considered inappropriate from a statistical viewpoint; consequently, analyses were not conducted among the third- and fourth-year students.

4.3 Differences Considering Sex

Descriptive statistics of MPSs for each sex are shown in Table 3 and the boxplots in Figures 3.1 through 3.4. The results of Bayesian t tests and δ med and their 95% CrIs are also shown in Table 3. As stated in Section 3.4, the number of classes and their contents differed across various years; hence, the analyses were conducted for each grade (hereafter, the same notions and procedures). A consistent tendency was not found in Figures 3.1 to 3.4, and substantial evidence in favor of the differences between men and women were not found in each school year in Table 3. Preferences are likely not to be affected much by differences pertaining to sex. One of the results in Table 3, which shows that first-year female students appear to slightly prefer online classes to brick-and-mortar classes but not with adequate

Table 3

Descriptives of Means of Preference Scores for Each Sex, Bayes Factors (BF_{10}), Medians for the Posterior Effect Size Estimates (δ med), and 95% Credible Intervals (95% CrIs) of Effect Size

Grade	Men				Women				BF_{10}	δ med	95% CrI
	<i>n</i>	<i>M</i>	95% CrI	<i>SD</i>	<i>n</i>	<i>M</i>	95% CrI	<i>SD</i>			
1 st -Year	18	3.00	[2.37, 3.63]	1.27	32	3.25	[2.91, 3.59]	0.94	0.37	0.18	[-0.33, 0.72]
2 nd -Year	8	3.91	[2.87, 4.94]	1.24	20	3.09	[2.60, 3.58]	1.05	1.13	0.54	[-0.18, 1.37]
3 rd -Year	15	3.32	[2.58, 4.06]	1.34	25	3.47	[3.05, 3.88]	1.00	0.34	0.10	[-0.46, 0.67]
4 th -Year	8	2.06	[1.71, 2.41]	0.42	18	2.88	[2.41, 3.34]	0.94	2.39	0.75	[-0.03, 1.64]

Figure 3.1
MPSs for Each Sex
(1st Year Students)

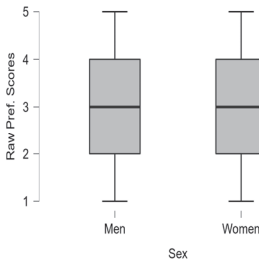


Figure 3.2
MPSs for Each Sex
(2nd Year Students)

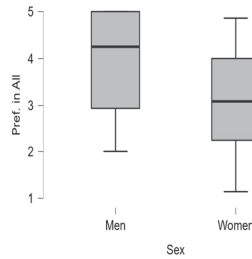


Figure 3.3
MPSs for Each Sex
(3rd Year Students)

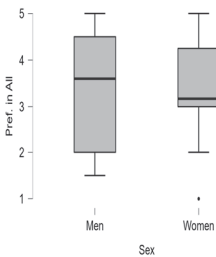
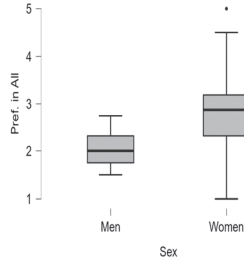


Figure 3.4
MPSs for Each Sex
(4th Year Students)



evidence ($M = 3.25 [2.91, 3.59]$), seems to be different from Imamura (2021), which reported that 85.2% of all the respondents (27 first-year female students) prefer brick-and-mortar classes to their distance learning (classes mixed with on-demand and synchronous-online learning).

4.4 Differences in Commuting Time

Descriptive statistics of MPSs for each commuting interval are presented in Tables 4.1 through 4.4 and the boxplots in Figures 4.1 through 4.4. We need to pay attention to the numbers of the respondents in each row of commuting interval in these tables and figures, as some rows can contain only a few respondents. In addition, attention should be paid to the responses of “8. Can’t commute,” because they differ from the other responses in the meaning of commuting time. Bayesian ANOVAs were not conducted for these reasons; however, we can see that there was a tendency that MPSs may not have shown differences for any commuting time intervals in each school year. The author suspected that students with longer commuting time preferred online classes relatively more because they could save time and experience less fatigue and that students living alone in apartments with less commuting time prefer brick-and-mortar classes because it was frequently

Table 4.1

Descriptives of MPSs for Each Commuting Time Interval (CTI) (1st Year Students)

CTI	<i>n</i>	<i>M</i>	95% CrI		<i>SD</i>
			Lower	Upper	
1. ≤30 min	7	2.92	1.69	4.15	1.33
2. ≤60 min	9	2.98	2.43	3.52	0.71
3. ≤90 min	13	3.29	2.82	3.76	0.78
4. ≤120 m.	10	3.07	2.21	3.92	1.20
5. ≤150 m.	6	3.22	1.64	4.80	1.51
6. ≤180 m.	2	2.45	-4.61	9.50	0.79
7. >180 m.	0	-	-	-	-
8. Can't commute	3	4.33	1.47	7.20	1.16

Figure 4.1

A Boxplot of MPSs for Each CTI (1st Year Students)

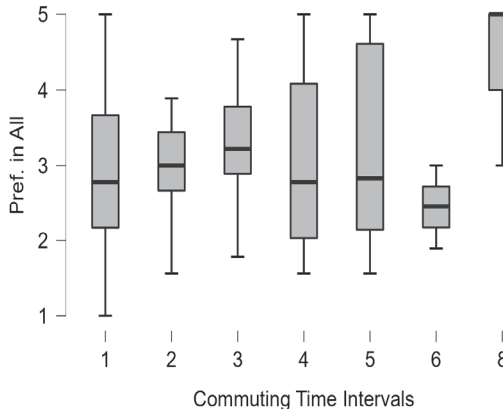
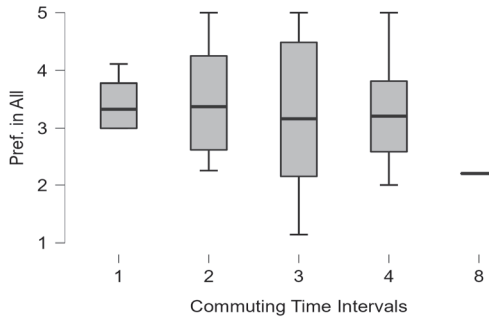


Table 4.2

Descriptives of MPSs for Each Commuting Time (CTI) (2nd Year Students)

CTI	n	M	95% CrI		SD
			Lower	Upper	
1. ≤30 min	5	3.44	2.84	4.05	0.49
2. ≤60 min	4	3.50	1.52	5.48	1.24
3. ≤90 min	14	3.25	2.47	4.02	1.34
4. ≤120 m.	6	3.30	2.16	4.44	1.09
8. Can't commute	1	2.20	-	-	-

Figure 4.2*A Boxplot of MPSs for Each CTI (2nd Year Students)***Table 4.3***Descriptives of MPSs for Each Commuting Time Interval (CTI) (3rd Year Students)*

CTI	n	M	95% CrI		SD
			Lower	Upper	
1. ≤30 min	9	3.62	2.63	4.61	1.29
2. ≤60 min	10	2.99	2.32	3.67	0.94
3. ≤90 min	6	3.10	2.26	3.94	0.80
4. ≤120 m.	10	3.56	2.61	4.51	1.33
5. ≤150 m.	1	5.00	-	-	-
6. ≤180 m.	1	2.50	-	-	-
8. Can't commute	3	4.08	1.90	6.26	0.88

Figure 4.3

A Boxplot of MPSs for Each CTI (3rd Year Students)

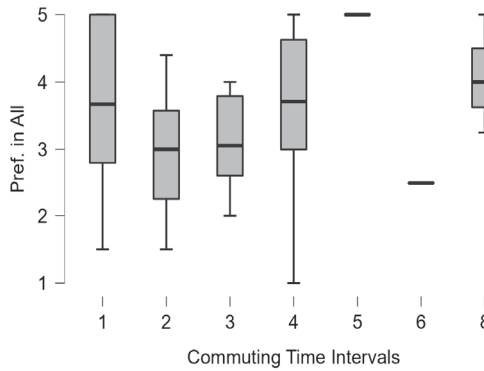


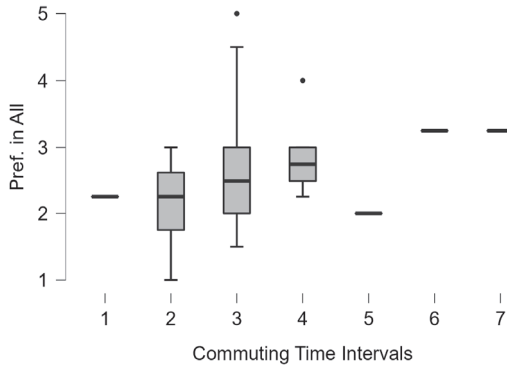
Table 4.4

Descriptives of MPSs for Each Commuting Time Interval (CTI) (4th Year Students)

CTI	n	M	95% CrI		SD
			Lower	Upper	
1. ≤30 min	1	2.25	-	-	-
2. ≤60 min	4	2.13	-	-	-
3. ≤90 min	14	2.82	2.14	3.51	1.19
4. ≤120 m.	5	2.90	2.06	3.74	0.68
5. ≤150 m.	1	2.00	-	-	-
6. ≤180 m.	1	3.25	-	-	-
7. >180 m.	1	3.25	-	-	-

Figure 4.4

A Boxplot of MPSs for Each CTI (4th Year Students)



reported by the media and was also confirmed in Section 4.6 below that university students who lived in their apartments alone suffered from and complained about their loneliness and lack of close contact with their classmates and friends; however, the data seem to show that student preferences for online classes were not affected by the length of commuting time. This result corresponds to the result of Kim et al. (2021), which surveyed 128 female freshmen at the Department of English in a Women’s College in Kyoto.

4.5 Differences in English Abilities

Bayesian Pearson correlations were estimated between the MPSs and TOEIC IP (Online) scores for Years 1 to 3 and are shown in Table 5. Some of the participants did not take the test; hence, the size of the sample data was reduced to a certain extent. MPSs include all the content of classes; thus the MPSs produced only in classes related to English learning and/or improving were calculated and described as “MPSs in Eng.” These were additionally utilized with the expectation that there was a higher correlation with the TOEIC IP scores. More than half of the participants did not take classes related to English learning and/or improving during the third year, thereby reducing the number of “MPSs in Eng.” by half. Considering

Table 5

Bayesian Pearson Correlations Between MPSs in All (or MPSs in Eng.) and TOEIC IP Scores, Their Bayes Factors (BF_{10}), and 95% Credible Intervals (CrIs) of Correlation Coefficients

Figure	Grade	Variable 1	Variable 2	n	r	95% CrI		BF_{10}
						Lower	Upper	
5.1	1 st -Year	MPS in All	TOEIC IP	45	-.029	-.310	.258	0.19
5.2	1 st -Year	MPS in Eng.	TOEIC IP	45	.030	-.258	.311	0.19
5.3	2 nd -Year	MPS in All	TOEIC IP	23	-.033	-.414	.362	0.26
5.4	2 nd -Year	MPS in Eng.	TOEIC IP	23	-.129	-.487	.281	0.30
5.5	3 rd -Year	MPS in All	TOEIC IP	28	.035	-.326	.383	0.24
—	3 rd -Year	MPS in Eng.	TOEIC IP	13	—	—	—	—

Figure 5.1
MPS in All and TOEIC IP
(1st Year Students)

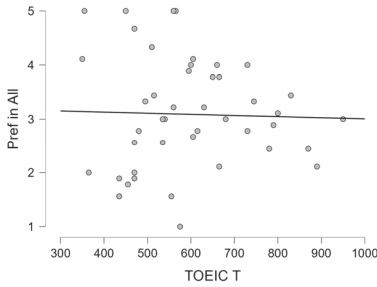


Figure 5.2
MPS in Eng. and TOEIC IP
(1st Year Students)

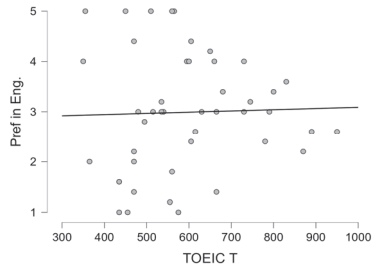


Figure 5.3
MPS in All and TOEIC
(2nd Year Students)

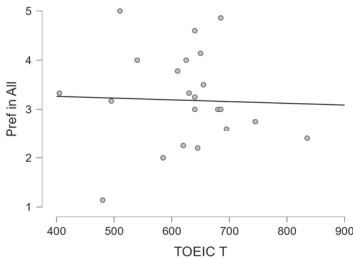


Figure 5.4
MPS in Eng. and TOEIC IP
(2nd Year Students)

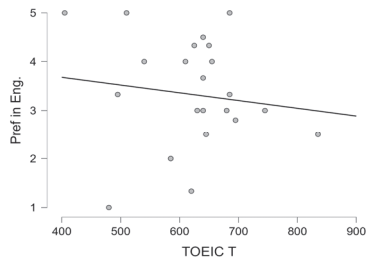
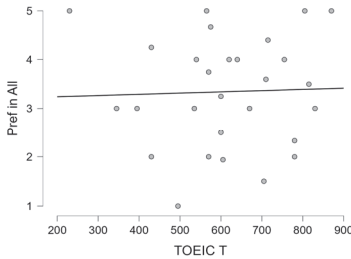


Figure 5.5
MPS in All and TOEIC IP
(3rd Year Students)



this situation, a correlation between “MPSs in Eng.” and TOEIC IP scores was not calculated for the third-year students. Table 5 shows the results of the estimates mentioned above, and Figures 5.1 through 5.5 show their scatterplots. Thus, there is substantial evidence that MPSs were not correlated with the TOEIC IP scores at all during the first ($r = -.03 [-.31, .26]$, $BF_{10} = 0.19$), second ($r = -.03 [-.41, .36]$, $BF_{10} = 0.26$), and third ($r = .04 [-.33, .38]$, $BF_{10} = 0.24$) years and that even MPSs only in classes related to English learning were not correlated with TOEIC IP scores at all for the first ($r = .03 [-.26, .31]$, $BF_{10} = 0.19$) and second ($r = -.13 [-.49, .28]$, $BF_{10} = 0.30$) years. It was found that preferences for brick-and-mortar or online English classes were not affected by the students’ English abilities. If students with higher or lower English abilities had been likely to avoid taking online English classes, it would be suggested that we should pay more attention to those students and their reasons. This result might imply that the challenges and disadvantages related to online classes including English-language ones were not affected at all by the students’ higher or lower English abilities.

4.6 Open-Ended Responses

The results of the text mining (text analysis) for the responses (written in Japanese) to the open-ended questions in Q4, Q5, and Q6, utilizing co-occurrence networks, are shown in Figures 6.1, 6.2, and 6.3, respectively. Japanese words in

larger circles in Figures 6.1, 6.2, and 6.3 indicate the more frequently used words in the responses to the open-ended questionnaires. Coefficients between the Japanese words in the circles show Jaccard indices (J), which fall in between 0 and 1 ($0 \leq J \leq 1$). Higher J coefficients indicate more frequent co-occurrences or stronger associations between the two Japanese words; lower J or nearer-zero J coefficients indicate less or little co-occurrences or associations and are not shown in these Figures. Some words with stronger associations are automatically grouped and colored as a subgraph. We find some evidence to back up some of the following results of the qualitative analysis as described below.

As for the results of the qualitative analysis for Q4, Q5, and Q6, various comments in favor of brick-and-mortar or online classes were made. Some students said that they had issues with the quality and stability of the online communication of their teachers or themselves and the quality of sound, especially when listening to English and their second foreign languages. Many evaluated online classes as

Figure 6.1
Q4 English Language Online Classes

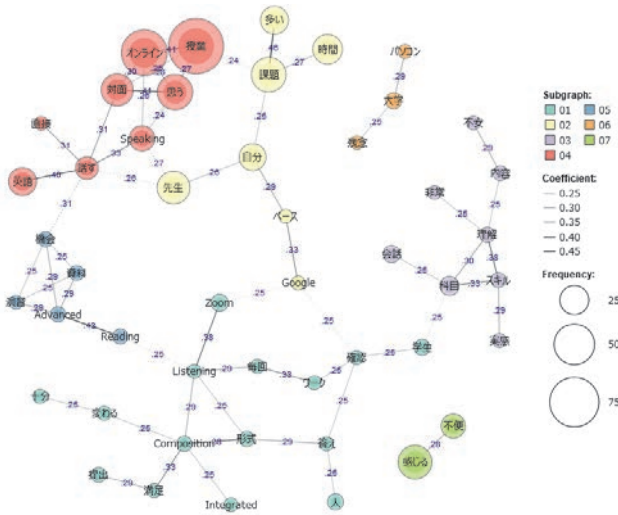


Figure 6.2
Q5 Other Online Classes

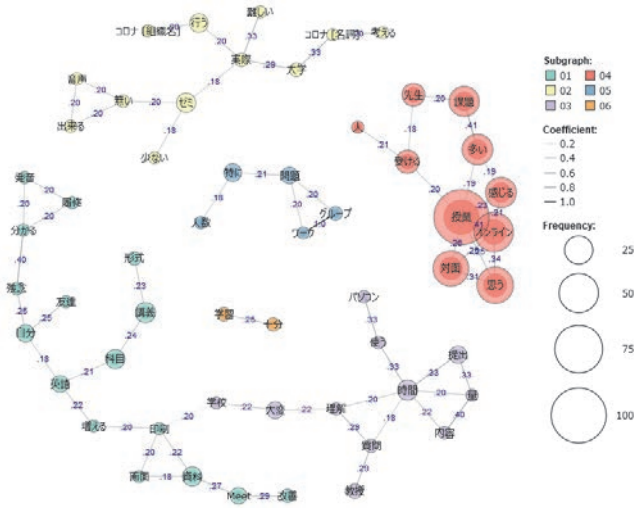
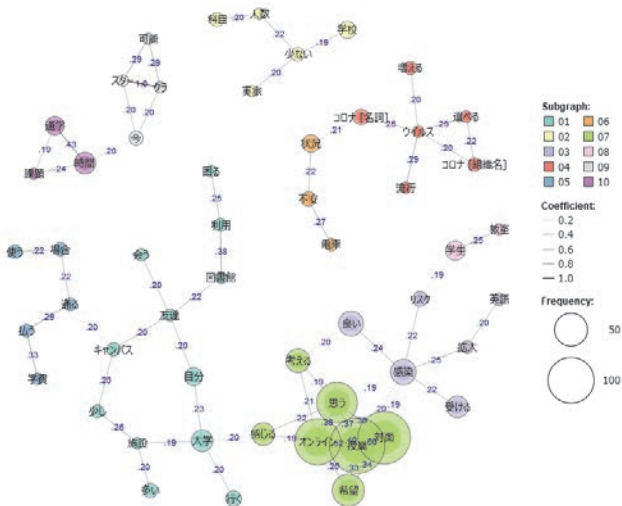


Figure 6.3
Q6 Preferences Pertaining to Brick-and-Mortar or Online Classes



educationally effective overall, but others were dissatisfied with less interactions with teachers and especially with their peers and fewer opportunities to pose questions to both teachers and peers (as similarly reported in Leis and Castro, 2021). These dissatisfactions were found in the responses to both Q4 and Q5 but were found much more in English Speaking classes and Integrated English classes, where only English is spoken among approximately 20 students or less. In addition, several students complained about a large number of tasks or homework required to be submitted through LMS by the deadline, which seemed to give them less time to finish assignments. This is supported in Figures 6.1 and 6.2 (e.g. the J coefficients between “the tasks (*kadai*)” and “much (*ooii*)” are .46 in Q4 and .41 in Q5, respectively). A few complained about the expenses incurred in printing out the materials at home. This is backed up in Figure 6.2 (e.g. the J coefficient between “the printing (*insatsu*)” and “being increased (*hueru*)” is .20 in Q5). Some students did not have their own printers and printed the material at convenience stores; most of them did not have laser printers, whose running cost is much lower. Students living in apartments by themselves were stressed out because of loneliness; first-year students suffered more from fewer chances to make friends on campus. This can also be found in Figure 6.3 (e.g. the J coefficient between “friends (*tomodachi*)” and “see (*au*)” is .20 and the one between “friends (*tomodachi*)” and “university campus (*kyanpasu*)” is .20 in Q6).

Analyzing the students' comments, as some respondents stated, the essential problem seemed to be not the online classes themselves but, as a consequence of no or a few brick-and-mortar classes, face-to-face activities and/or face-to-face human relationships that were not possible at all or were limited.

5. Conclusion

This survey was conducted at the Department of English, School of Letters, where various English classes, such as Speaking, Listening, Reading, Composition, Four-Skill Integrated English, and other advanced courses were offered. Considering the results pertaining to the students' preferences for brick-and-mortar or online

classes, it may be concluded that (1) they were slightly affected by the differences in the school year—only fourth-year students differed in this regard and preferred brick-and-mortar classes relatively more; (2) they were hardly affected by the differences in the class content, but, as an exception, the first-year students preferred brick-and-mortar classes in English Speaking and Integrated English, which were taught by native English speakers; (3) preferences were likely not to be affected much by differences pertaining to sex, and a consistent tendency was not found; (4) they were not at all affected by the differences in commuting time as similarly reported in Kim et al. (2021); and (5) they were not affected by the differences in English abilities at all, even in classes related to English learning and/or training. Specific to the English classes, the quality and stability of online communication and the quality of sound, especially when listening to English, seem to be more important. The results of this study indicate that the university students' attributions (school year, sex, commuting times) and their TOEIC scores hardly affected their preferences on synchronous online classes, which could be considered preferable trends with regard to educational mediums. In contrast, the attributions in this study did not include the students' financial situation, which often decides their environment related to hardware, software, and information communication. This attribution should also be considered because Irwin (2021, p. 113) reported that “there was a significant difference in satisfaction levels between students who had unlimited data plans and those who did not.”

This investigation was conducted in PDCA cycles at one department, one faculty, and one university to obtain certain implications on educational practices and institutional policies in December 2020 when teachers had to adjust to classes during the COVID-19 pandemic. The number of respondents and their schools were insufficient with regard to the external validity of this study. However, living in unusual, unprecedented, and uncertain times due to the COVID-19 pandemic which continue as of December 2022, findings from small data should be released promptly, shared, and accumulated in educational research. Thus, educational findings with certainty and external validity may be obtained sooner, and they are

expected to be informative and useful when deciding whether or not to continue some of synchronous online English classes in addition to more brick-and-mortar classes after the pandemic ends.

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