

## Article

# Japanese Medical Students' English Language Learning Motivation, Willingness to Communicate, and the Impact of the COVID-19 Pandemic

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**Abstract:** For non-English-speaking nations such as Japan, proficiency in English has emerged as an indispensable skill, particularly in scientific fields like medicine. This research paper extends prior investigations into the motivations of Japanese medical students for learning English and delves into their willingness to communicate (WTC) in English. Importantly, it explores the impact of the COVID-19 pandemic on these motivations and communication behaviors. This study reveals that Japanese medical students are strongly instrumentally and vocationally motivated, viewing English as a practical asset for their future medical careers. They also exhibit a strong international posture, demonstrating an eagerness to engage with global cultures through English. Notably, the students' motivation to study English remains resilient despite the pandemic's challenges, such as the shift to remote learning and travel restrictions. However, their WTC in English exhibits nuanced changes. While overall WTC remains stable, students' inclination to give presentations in English decreases significantly, possibly due to reduced face-to-face interactions in virtual learning environments. Additionally, their interest in participating in international events and activities wanes, possibly influenced by pandemic-related travel anxiety. These findings underscore the importance of offering specialized English classes and study abroad/international exchange experiences to sustain students' motivation to learn English.

**Keywords:** medical English; motivation; willingness to communicate; COVID-19; international posture; undergraduate medical education; English as a second language



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## 1. Introduction

For non-English-speaking nations like Japan, where cross-cultural and international interactions have become an important facet of numerous professional domains, proficiency in English has become an essential skill. One such professional domain is medicine, where English proficiency not only serves as a conduit for effective global communication and collaboration but also facilitates care for English-speaking patients and access to international medical literature [1]. This paper builds on our former investigation into motivations driving Japanese medical students to study English as a second language (L2) [2] and further explores their willingness to communicate (WTC) in English. Moreover, this study undertakes the critical task of investigating how these motivations and communication behaviors have been influenced by the unprecedented COVID-19 pandemic.

The nuances of learning a foreign language, especially English, are influenced by multifaceted dynamics and diverse studies have sought to investigate these factors among

Japanese college students [2–4]. Within the context of medical education, where rigorous academic demands and a globalized health care landscape intersect, the motivation to study English becomes even more profound. Previously, we created an original survey to assess the underlying factors and degree to which students are motivated to study English [2]. We discovered that Japanese medical students were primarily “instrumentally” and “vocationally” motivated; meaning that learning English would be useful for them professionally. They also showed high levels of international posture, and a desire to travel and engage in cross-cultural activities. This study, however, did not deeply explore the participants’ WTC, which is indispensable for effective L2 acquisition. WTC is associated with a complex balance of psychological, cultural, and situational factors. Yashima elucidated the interplay of motivation, self-confidence in L2, WTC and international posture [5]. Understanding this dynamic is especially pertinent for medical students, as effective communication can have profound implications for patient care and medical practice. Given the global nature of health care, a medical student’s ability to engage in English communication becomes a pivotal skill, reflecting the ever-growing need for cross-border collaboration. During the COVID-19 pandemic, however, cross-borders became closed borders and social interactions became social distances.

The pandemic has disrupted various aspects of education and English language learning among Japanese medical students has not been spared. As the pandemic necessitated shifts towards remote learning, the traditional medical classroom setting underwent a transformative change [6]. Medical students and teaching faculty, like those from other disciplines, were compelled to adapt to virtual learning environments, challenging accustomed modes of education [6]. Such alterations, we hypothesized would inevitably influence both their motivation to study English and their WTC in both positive and negative ways, potentially leading to changes in learning strategies, engagement, and proficiency. Thus, alongside our curiosity about the interaction between motivation and WTC among our medical students, we were also keen to investigate potential changes and influences brought during the pandemic period.

By examining the relationship between motivational factors and WTC, and how they have evolved over the duration of the COVID-19 pandemic, this research paper aims to contribute to a comprehensive understanding of the L2 learning experience among Japanese medical students, particularly over this pedagogically challenging time.

## 2. Materials and Methods

### 2.1. Participants

Participants were a convenience sample of three groups of second-year medical students of a large national university in Japan who were studying on a mandatory English for medical purposes (EMP) course. As part of the curriculum at our medical school, students have compulsory English classes in their first two years and from the second year, shift from studying general English to learning specialized medical English, such as medical terminology and doctor-patient communications. In this EMP course, taught over two semesters, students learn the basic skills of taking a medical history in English, physical examination, explaining diagnoses, and medical case presentation. The course includes students with varied levels of English ability. For this study and the creation of the survey tool (discussed below), we hypothesized that the students’ abilities would be normally distributed, as shown by objective grading for past courses. Each year group has approximately 150 students, approximately 35 to 40% are female, and the average age is approximately 20 years. All the students were Japanese nationals except for one who was Chinese. The survey was administered to three separate cohorts of second year students at three time points: (1) the pre-pandemic group (2019); (2) the mid-pandemic group (2020); and (3) the late-pandemic group (2022). Objective course assessments confirmed a normal distribution of performance consistent for all three cohorts.

## 2.2. Data Collection

Data were collected through an original questionnaire survey (Appendix A). The survey was designed by three experienced specialists in medical English education and consisted of 20 items over two domains measuring motivation to study English (10 items) and WTC (10 items). The survey items were devised based on the findings of our previously mentioned study in which quantitative and qualitative methods were used to explore into Japanese medical students L2 learning motivations. The survey used in the original study had a Cronbach alpha score of 0.911, indicating high internal consistency and reliability [2].

The items in the motivation domain, written in the future tense, asked about pertinent factors that might motivate a medical student to study English (identified in our previous study [2]) and the degree to which those factors motivate the student. These items explored the students' self-perception of their "Ideal L2 Self" (i.e., for internal self-fulfillment), their "Ought To L2 Self" (i.e., meeting external expectations or requirements) [7], and their "international posture", a phrase coined by Yashima, meaning their openness to other cultures and global affairs [8]. The 10 items in the WTC domain, written in the present tense, were aimed at probing their current practice and engagement in English communication and also their international posture. While divided into these two sections, we hypothesized that "motivation" would act as an overarching factor, i.e., students with higher scores in the motivation section would likely have higher scores in the WTC section as well. All the survey items were tailored towards the target population of medical students. Responses were made on a 6-point Likert-like scale. The survey was completely anonymous and students were informed in writing and orally that completion of the survey indicated consent to participate in this study.

## 2.3. Data Analyses

Data were converted into Microsoft Excel (Microsoft Co., Redmond, WA, USA) spreadsheets, and comparisons were made among the results from the three groups. The Levene test was used to check for homogeneity of variance within the data set (Supplementary Table S1). A post hoc power analysis was calculated using the effect size in each group, with a type I error set at 0.05 and power at 0.80. One-way analysis of variance (ANOVA) was performed with eta-squared ( $\eta^2$ ) calculated to quantify the effect size. The one-way ANOVA with multiple comparisons were used to examine the differences between the groups for each survey item. For the multiple comparisons, the Tukey test was employed to control for the increased risk of type I errors. Significance was defined as  $p < 0.05$ . Data are shown as the mean  $\pm$  SD. Statistical analyses were performed using SPSS version 28.0 (IBM Corporation, Armonk, NY, USA) and Microsoft Excel for Mac version 16.28 Analysis Toolpak.

## 2.4. Ethical Considerations

All participants gave informed consent to participate in this study. Approval for this research was obtained from the Ethical Committee of the Institute of Medicine, University of Tsukuba (approval number: 1873).

## 3. Results

In total, 379 students participated in the survey. After excluding 24 surveys that had one or more missing responses, 355 surveys were included in the final analysis (pre-pandemic group,  $n = 113$ ; mid-pandemic group,  $n = 120$ ; and late-pandemic group,  $n = 122$ ).

### 3.1. Survey Validity

Using the pre-pandemic group ( $n = 113$ ) as a sample, separate Cronbach alphas were calculated for the motivation and WTC domains of the survey instrument rendering scores of 0.92 and 0.93, respectively, indicating high internal consistency and validity. An exploratory factor analysis (EFA) of the survey (using the combined results from all 3 groups,  $n = 355$ ) indicated that while Factor 1 (motivation) seems to represent a general

attitude towards English, encompassing both motivation and WTC, Factor 2 does indeed, more specifically, distinguish the WTC aspect. This differentiation suggested that while “motivation” was a strong overarching factor that influenced all items, as we suspected, WTC formed a somewhat distinct dimension within the data (Supplementary Table S2). Further, correlation between the motivation and WTC factors was investigated using the mean values for each student for each factor, which revealed, as hypothesized, a strong correlation (0.794) between the two factors.

### 3.2. Survey Results

Table 1 shows the mean scores for each survey item and the mean total score for the two sections for the three groups. Comparing the two sections, we can see that the motivation section scores were consistently higher than the WTC section with the total mean scores of 4.22 and 3.57, respectively. Particularly high-scoring items were those in the motivation section that pertain to students’ international posture: 1. I want to speak English with foreign visitors to Japan (mean: 4.60); 2. I want to speak English for traveling overseas (4.91); 3. I want to be part of the global community of people who can communicate in English (4.33) and; 4. I think knowing English can help me understand the world better (4.93). Also, consistently high-scoring were some of the items related to their vocation in medicine: 5. I want to be good at English so I can read articles in international medical journals (4.36); and 8. In the future, I want to speak to foreign patients in English (4.34). In contrast, the lowest-scoring items were: 13. In English class, I like to give presentations (3.20); 14. In English class, I like to raise my hand to answer the teacher’s questions (2.99); and 15. I like to talk to my English teacher after class (3.44). The Motivation and WTC sections both showed a gradual decreasing trend from the pre-pandemic and late-pandemic groups (motivation section: 4.26–4.19 and WTC section: 3.66–3.47). Comparing the pre-pandemic and late-pandemic groups 6 items in the motivation section (3, 5, 6, 7, 9, and 10) and seven items in the WTC section (13, 14, 15, 16, 17, 18, and 20) showed a slight decreasing trend in mean score.

### 3.3. Statistical Analysis

Results of the statistical analysis reveal that, on the whole, neither student motivation for studying English, nor their WTC was significantly changed over the study period. Table 2 shows the main results of the statistical analysis that was used to investigate whether any significant changes had occurred between the three groups. Interestingly, only one item, from the WTC section, was found to have had any statistically significant change, namely, 13. In English class, I like to give presentations. This item was found to have significantly decreased between the mid-pandemic to the late-pandemic groups ( $p = 0.029$ ). Another item in the WTC section, 17. I like to participate in international events and activities offered by the university, was found to have decreased but did not reach statistical significance ( $p = 0.086$ ).

**Table 1.** Mean survey scores for each item for the pre-, mid-, and late-pandemic groups.

		Pre-Pandemic	Mid-Pandemic	Late-Pandemic	Total
Motivation Section Items		Mean $\pm$ SD	Mean $\pm$ SD	Mean $\pm$ SD	Mean $\pm$ SD
1.	I want to speak English with foreign visitors to Japan.	4.56 $\pm$ 1.0	4.65 $\pm$ 1.1	4.60 $\pm$ 1.2	4.60 $\pm$ 1.1
2.	I want to speak English for traveling overseas.	4.81 $\pm$ 0.9	4.90 $\pm$ 1.0	4.99 $\pm$ 1.0	4.91 $\pm$ 1.0
3.	I want to be part of the global community of people who can communicate in English.	4.37 $\pm$ 1.0	4.39 $\pm$ 1.1	4.22 $\pm$ 1.3	4.33 $\pm$ 1.2
4.	I think knowing English can help me understand the world better.	4.80 $\pm$ 0.9	5.07 $\pm$ 0.9	4.90 $\pm$ 1.1	4.93 $\pm$ 1.0
5.	I want to be good at English so I can read articles in international medical journals.	4.40 $\pm$ 1.2	4.36 $\pm$ 1.2	4.33 $\pm$ 1.3	4.36 $\pm$ 1.3
6.	In the future, I want to publish my research in international medical journals.	3.83 $\pm$ 1.1	3.72 $\pm$ 1.3	3.63 $\pm$ 1.4	3.7 $\pm$ 1.3
7.	In the future I want to make a presentation at an international conference in English.	3.85 $\pm$ 1.1	3.73 $\pm$ 1.2	3.60 $\pm$ 1.4	3.72 $\pm$ 1.3
8.	In the future, I want to speak to foreign patients in English.	4.23 $\pm$ 1.1	4.45 $\pm$ 1.2	4.34 $\pm$ 1.3	4.34 $\pm$ 1.2
9.	In the future, I want to work in another country.	3.67 $\pm$ 1.2	3.59 $\pm$ 1.5	3.46 $\pm$ 1.5	3.57 $\pm$ 1.4
10.	In the future, I want to study abroad.	4.11 $\pm$ 1.2	3.98 $\pm$ 1.3	3.85 $\pm$ 1.5	3.98 $\pm$ 1.3
Motivation section total mean scores		4.26 $\pm$ 1.1	4.28 $\pm$ 1.2	4.19 $\pm$ 1.3	4.25 $\pm$ 1.2
Willingness to communicate (WTC) Section Items					
11.	In English class, I like to speak English in pairs.	3.79 $\pm$ 1.1	4.00 $\pm$ 1.1	3.92 $\pm$ 1.2	3.91 $\pm$ 1.1
12.	In English class, I like to speak English in small groups.	3.67 $\pm$ 1.1	3.78 $\pm$ 1.1	3.71 $\pm$ 1.2	3.72 $\pm$ 1.1
13.	In English class, I like to give presentations.	3.28 $\pm$ 1.1	3.36 $\pm$ 1.2	2.96 $\pm$ 1.3	3.20 $\pm$ 1.2
14.	In English class, I like to raise my hand to answer the teacher's questions.	3.10 $\pm$ 1.1	3.05 $\pm$ 1.1	2.84 $\pm$ 1.3	2.99 $\pm$ 1.2
15.	I like to talk to my English teacher after class.	3.53 $\pm$ 1.1	3.50 $\pm$ 1.1	3.30 $\pm$ 1.3	3.44 $\pm$ 1.2
16.	I like to talk to international students on campus in English.	3.81 $\pm$ 1.2	3.90 $\pm$ 1.2	3.5 $\pm$ 1.3	3.75 $\pm$ 1.2
17.	I like to participate in international events and activities offered by the university.	3.69 $\pm$ 1.2	3.61 $\pm$ 1.2	3.35 $\pm$ 1.3	3.54 $\pm$ 1.2
18.	I like to interact in English on social media.	3.79 $\pm$ 1.2	3.78 $\pm$ 1.2	3.47 $\pm$ 1.3	3.67 $\pm$ 1.2
19.	I like to help foreigners I meet outside of the university.	4.04 $\pm$ 1.1	4.25 $\pm$ 1.1	4.06 $\pm$ 1.2	4.12 $\pm$ 1.1
20.	I like to write English e-mails or texts.	3.78 $\pm$ 1.2	3.68 $\pm$ 1.2	3.48 $\pm$ 1.3	3.64 $\pm$ 1.2
WTC section total mean scores		3.65 $\pm$ 1.1	3.69 $\pm$ 1.2	3.47 $\pm$ 1.3	3.60 $\pm$ 1.2

SD, standard deviation.

**Table 2.** Statistical analysis of changes within mean scores between the pre-, mid-, and late-pandemic groups.

Survey Items	Pre- and Mid-Pandemic Comparison (P)	Pre- and Late-Pandemic Comparison (P)	Mid- and Late-Pandemic Comparison (P)	Effect Sizeliwen ( $\eta^2$ )
1. I want to speak English with foreign visitors to Japan.	0.801	0.964	0.964	0.068
2. I want to speak English for traveling overseas.	0.798	0.379	0.755	0.375
3. I want to be part of the global community of people who can communicate in English.	0.992	0.600	0.501	0.343
4. I think knowing English can help me under-stand the world better.	0.114	0.718	0.411	0.534
5. I want to be good at English so I can read articles in international medical journals.	0.978	0.922	0.980	0.058
6. In the future, I want to publish my research in international medical journals.	0.803	0.474	0.844	0.326
7. In the future I want to make a presentation at an international conference in English.	0.763	0.291	0.685	0.419
8. In the future, I want to speak to foreign patients in English.	0.341	0.785	0.723	0.394
9. In the future, I want to work in another country.	0.902	0.477	0.732	0.331
10. In the future, I want to study abroad.	0.772	0.331	0.725	0.398
11. In English class, I like to speak English in pairs.	0.345	0.676	0.835	0.392
12. In English class, I like to speak English in small groups.	0.776	0.968	0.893	0.076
13. In English class, I like to give presentations	0.872	0.119	0.029 *	0.650
14. In English class, I like to raise my hand to answer the teacher's questions.	0.959	0.221	0.324	0.489
15. I like to talk to my English teacher after class.	0.978	0.299	0.377	0.452
16. I like to talk to international students on campus in English.	0.841	0.964	0.100	0.552
17. I like to participate in international events and activities offered by the university.	0.873	0.086	0.215	0.545
18. I like to interact in English on social media.	0.998	0.121	0.120	0.585
19. I like to help foreigners I meet outside of the university.	0.360	0.993	0.394	0.430
20. I like to write English e-mails or texts.	0.839	0.174	0.413	0.497

One-way analysis of variance (ANOVA) results with eta-squared ( $\eta^2$ ) calculated as the effect size and post hoc Tukey test for multiple comparisons; \*  $p < 0.05$ .

#### 4. Discussion

The findings presented in this research paper shed light on the motivations and willingness to communicate (WTC) in English among Japanese medical students, with a specific focus on the impact of the COVID-19 pandemic. In this section, we will discuss the

key results and their implications for the broader context of language learning and medical education, within this post-pandemic period.

The motivations of Japanese medical students to study English were found to be multifaceted, aligning with prior research in this field [2–4,9–12]. The students displayed strong instrumental and vocational motivations, emphasizing the practicality of English proficiency for their future medical careers. They expressed a desire to read international medical journals, communicate with foreign patients, and potentially work in other countries, reflecting a pragmatic approach to language learning that was strongly evident in our previous study [2]. In this context, our findings indicate that, for Japanese medical students, the perceived necessity of English in the globalized medical landscape serves as a motivating factor for their English study. This finding again underscores the necessity for providing English L2 education tailored to the needs of the particular students, such as the EMP classes now taught in many institutions across Japan.

Moreover, the students exhibited a high level of international posture, expressing a keen interest in engaging with global communities and cultures through English. This international posture was evidenced by their desire to interact with foreign visitors to Japan, travel overseas, and be part of the global English-speaking community. Such motivations highlight the interplay between language learning and cultural engagement, reflecting a broader trend in which English proficiency is viewed as a gateway to global citizenship in Japan [13,14]. A number of studies among Japanese university students [8,15], including medical students [16], point to the importance of international posture in motivating English language study. The University of Tsukuba, where the current study took place, was selected as a top-ranked institution within the Japanese Ministry of Education, Culture, Sports, Science and Technology “Top Global University Project” [17,18]. Within the university’s Institute of Medicine, a number of programs are available for students to engage in meaningful overseas educational experiences [19], and sixth-year medical students can opt to complete part of the clinical clerkship training overseas. The aims of these programs are to encourage student’s international posture, increase motivation for study, and develop English language communication skills, which is in line with the Japanese Government’s push for universities to engage in global human resource training [18].

It is noteworthy that the motivation scores remained relatively stable across the pre-pandemic, mid-pandemic, and late-pandemic groups. This suggests that the overarching motivation to study English among Japanese medical students has been largely resilient to the disruptions caused by the COVID-19 pandemic. Despite the challenges posed by the shift to remote learning [20] and the closure of international borders, the students’ commitment to their long-term career goals and global engagement remained largely unchanged. One possible contributing factor could be that the COVID-19 pandemic, while restricting student international mobility [21], might have actually increased the students’ ability to join in international activities through online exchange programs. Shimmi and colleagues reported on the large-scale adoption of online solutions by Japanese universities for continuing international exchanges and virtual learning [22]. In fact, Shimmi states that “it is crucial for [Japanese] universities to leverage newly developed online learning tools even after the COVID-19 pandemic, to offer inclusive international education to the larger student pool who are unable to study abroad [22].” Additionally, in a previous study of medical science students, we found, somewhat surprisingly, that their motivation to study had actually increased during the pandemic largely because they saw a connection between their medical science studies and the pandemic [23]. Interestingly, our findings on the resilience of student motivation are in accord with those of Haruta and colleagues, who studied students within the same institution (a few grades higher than our cohorts) from the perspective of professional identity [24]. They discovered that the COVID-19 had some positive impact on the strengthening of professional identity of medical students despite restrictions on their clinical practice during those vital years of their medical education [24]. They speculated that some of the students were perhaps consulted on a daily basis by family and friends regarding the pandemic, being—as medical students—perceived as experts and



authorities, and that this constant reinforcement might also have encouraged professional identity formation [24]. A study from the USA showed, similarly, that the pandemic experience influenced medical students' professional identity in both positive and negative ways [25]. Similarly, it is possible that the experience of the pandemic may have raised awareness of the students' identity as global citizens. Certainly, the pandemic reinforced the importance of international collaboration, particularly for those who are studying in health-care-related fields; this may have had a preservative effect on maintaining international posture throughout those years.

In contrast to their strong motivation, Japanese medical students' WTC in English exhibited more nuanced variations. Over the pre-pandemic to late-pandemic periods, the WTC section mean scores showed a very gradual decreasing trend; however, the individual items in the WTC section did not show significant changes over time, aside from two specific aspects. Firstly, the students' inclination to give presentations in English decreased significantly between the mid-pandemic and late-pandemic groups. This decline may be attributed to the challenges associated with virtual learning environments, where the absence of face-to-face interactions may have diminished students' confidence in public speaking. Interestingly, Matsuoka and colleagues found that in-class presentations increased student WTC, self-perceived communicative competence and comfortableness in speaking English [26]. Secondly, the students' interest in participating in international events and activities offered by the university showed a decreasing trend, albeit without strong statistical significance. This decline could be indicative of the broader impact of the pandemic on extracurricular engagement and social interactions, or increased travel anxiety related to COVID-19 [27,28]. Regarding the finding of lower mean WTC section scores compared to motivation section scores, this result is consistent with observations about the general communication apprehension or reluctance to speak English long associated with Japanese university students [5,29,30], but the pandemic may have some effect (both positive and negative) on WTC over time as indicated by a number of emerging studies [31–35].

The findings of this study have several implications for both language educators and medical institutions. Firstly, it underscores the importance of maintaining and promoting students' motivation to learn English, especially in professional fields like medicine where English proficiency can have far-reaching implications. The second year of medical school, the target population of the current study, was shown by Metakides and colleagues to be a time of particular importance as it is a period of lower motivation levels and higher levels of burnout [36]. Educators could leverage students' instrumental motivations and international posture to design engaging and contextually relevant language learning experiences; study abroad trips would be particularly effective in this regard. Secondly, the decline in students' willingness to give presentations and participate in international activities highlights the need for pedagogical adaptations in the virtual learning era. Language instructors should explore innovative ways to foster communication skills in virtual environments, including virtual presentations and online international collaborations.

Finally, there are limitations to the current study that should be addressed. Firstly, the cross-sectional design of this study investigated three separate cohorts of students during their second year of study at three different time points. While the three cohorts are very similar in terms of demographics and education and the results are arguably valid, longitudinal investigations, following the same cohort over the study period might have been interesting; possibly rendering different results showing a clearer evolution in student motivation and WTC over the pandemic period. Secondly, while the survey instrument used in this study underwent some standard tests for validity and reliability it was not validated among cohorts outside of the study participants. Additionally, using more established questionnaire instruments alongside our survey, to explore the research questions would be useful in future studies. Furthermore, qualitative investigations using semi-structured interviews or written reflections would be useful to add richer, more nuanced data to this topic. However, the strengths of this study, including the number

of participants and the timely data collection before, during, and towards the end of the pandemic, offset these shortcomings somewhat.

## 5. Conclusions

In conclusion, this research contributes to our understanding of the complex interplay between motivation and WTC and the effect of the COVID-19 pandemic, in the context of English language learning among Japanese medical students. Despite the challenges posed by the pandemic, such as the switch to online learning and social distancing, the students' motivations remained resilient, while certain aspects of their WTC exhibited slight variations. These findings are encouraging for educators in that they show not only the general resilience of student motivation for language learning but also their adaptability to new modes of learning. Our findings again highlight the importance of English for specific purposes, such as EMP classes for medical students, for maintaining students' instrumental motivation. Finally, our findings show that, despite the travel restrictions, students international posture remained high throughout the pandemic period. Leveraging student international posture as a motivator to study English, though study abroad programs or international exchange programs, for example, could help to increase students' English communication abilities and willingness. We hope that our insights will be of value for medical educators and institutions striving, like us, to enhance language learning outcomes in an increasingly globalized world.

**Supplementary Materials:** The following supporting information can be downloaded at: <https://www.mdpi.com/article/10.3390/ime2040027/s1>, Table S1: Results of Levene test; Table S2: Exploratory factor analysis of the original survey used in this study.

**Author Contributions:** Conceptualization, T.M. (Thomas Mayers) and B.J.M.; methodology, T.M. (Thomas Mayers), B.J.M., N.M. and T.M. (Tetsuhiro Maeno); formal analysis, T.M. (Thomas Mayers) and N.M.; investigation, T.M. (Thomas Mayers) and B.J.M.; data curation, T.M. (Thomas Mayers), B.J.M. and N.M.; visualization, T.M. (Thomas Mayers), B.J.M. and N.M.; supervision, T.M. (Thomas Mayers) and T.M. (Tetsuhiro Maeno); writing—original draft preparation, T.M. (Thomas Mayers); writing—review and editing, B.J.M., N.M. and T.M. (Tetsuhiro Maeno); administration, T.M. (Thomas Mayers), B.J.M., N.M. and T.M. (Tetsuhiro Maeno). All authors have read and agreed to the published version of the manuscript.

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**Informed Consent Statement:** Informed consent was obtained from all participants involved in this study.

**Data Availability Statement:** The data presented in this study are available on request from the corresponding author.

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**Conflicts of Interest:** The authors declare no conflict of interest.



## Appendix A

Appendix A shows the original questionnaire survey used in this study.

This survey is completely anonymous. Please do not write your name on the paper.

この調査は完全に匿名です。用紙に名前を書かないでください。

Please read each statement and circle the number to indicate how much you agree or disagree. それぞれの文を読み、どの程度同意するか反対するかを示す番号に○をつけてください。

	Statement	Strongly Disagree	Disagree	Somewhat disagree	Somewhat agree	Agree	Strongly Agree
1	I want to speak English with foreign visitors to Japan.	1	2	3	4	5	6
2	I want to speak English for traveling overseas.	1	2	3	4	5	6
3	I want to be part of the global community of people who can communicate in English.	1	2	3	4	5	6
4	I think knowing English can help me understand the world better.	1	2	3	4	5	6
5	I want to be good at English so I can read articles in international medical journals.	1	2	3	4	5	6
6	In the future, I want to publish my research in international medical journals.	1	2	3	4	5	6
7	In the future I want to make a presentation at an international conference in English.	1	2	3	4	5	6
8	In the future, I want to speak to foreign patients in English.	1	2	3	4	5	6
9	In the future, I want to work in another country.	1	2	3	4	5	6
10	In the future, I want to study abroad.	1	2	3	4	5	6

	Statement	Strongly Disagree	Disagree	Somewhat disagree	Somewhat agree	Agree	Strongly Agree
1	In English class, I like to speak English in pairs.	1	2	3	4	5	6
2	In English class, I like to speak English in small groups.	1	2	3	4	5	6
3	In English class, I like to give presentations.	1	2	3	4	5	6
4	In English class, I like to raise my hand to answer the teacher's questions.	1	2	3	4	5	6
5	I like to talk to my English teacher after class.	1	2	3	4	5	6
6	I like to talk to international students on campus in English.	1	2	3	4	5	6
7	I like to participate in international events and activities offered by the university.	1	2	3	4	5	6
8	I like to interact in English on social media.	1	2	3	4	5	6
9	I like to help foreigners I meet outside of the university.	1	2	3	4	5	6
10	I like to write English e-mails or texts.	1	2	3	4	5	6

By completing this questionnaire, you indicate your consent to participate in this study. Your participation in this study is greatly appreciated. このアンケートに回答することにより、この調査に参加することに同意したことになります。この研究へのご参加に感謝いたします。

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