〈Research Report〉

English Learning and Needs: A Survey of University Pharmaceutical Science Students

Steven Silsbee

Introduction and Background

As English levels among secondary school students in Japan fail to meet expectations, there remains a strong push from the Japanese government to increase and improve English education from elementary school through university (Kyodo News, 2019). Factors such as growing tourism rates (Fujita, Terui, Araki, & Naito, 2017) coupled with a desire to become more globalized (Hamada, 2018) have influenced the government's decision to place a high priority on English.

Japanese people, however, continue to have contrasting views about English. There are those who sincerely want to improve their English ability, while many others view English study with mixed feelings (Ryan, 2009). If Japan is to be successful in its quest to be a truly globalized nation, there needs to be a better understanding about how its people feel about English, and work to implement quality programs which can lead to higher levels of ability.

The purpose of this report is to gain insight into how Japanese students in a pharmaceutical science program view their English studies as well as how English will play a role in their future careers. As of this writing, the Japanese government is advocating stronger and more effective English education at all levels of schooling, however, the discrepancies between policy and reality shows the need for a better understanding of what should be taught and how (Hashimoto, 2009). In order to do this, a closer examination of how students perceive their current English study and future implications is needed. For this study, three questions were addressed:

1) What perceptions do pharmaceutical science students have about their English study?
2) To what extent do pharmaceutical science students feel English might affect their future profession?
3) What English skills and functions do pharmaceutical science students think are important for their future profession?

By answering these questions, it is hoped that a better understanding can be reached regarding how students studying pharmaceutical science feel about English study and its future significance.

Literature Review

As it falls behind other Asian countries in TOEFL, Japan cannot afford to slip lower in international standardized scores (Amaki, 2008). Sixty years after Gardner and Lambert's 1959 study, there remains a strong focus on EFL learners' attitudes toward the study of English. Learner attitude continues to be regarded as one of the most influential elements when it comes to language learning success (Fakeye, 2010; Montano & Kasprzyk, 2008; Reid, 2003; Visser, 2008). Much of the available literature is not kind to how students feel about learning English. Abidin, Pour-Mohammadi, and Alzwari (2012) found that students had a negative reaction when answering questions about their English learning, while Chen (1985) discovered not only a dislike of English study, but an intense fear and near hatred of it. Ahmed (2015) noted that while students had positive feelings toward learning and using English, they also had negative attitudes toward studying English in the classroom. Such attitudes may be brought about from anxiety (Williams & Andrade, 2008), or a feeling that English is not pertinent to their lives (Kikuchi, 2013; Maftoon & Ziafar, 2013). Whatever the case may be, it seems that for successful language learning to occur, we need to know what reasons students have for their positive or negative feelings about studying English (Burden, 2002). Furthermore, it should be noted that while integrative reasons have been shown to have a greater effect on the perception of English need over instrumental ones (Benson, 1991), each of the studies mentioned above reached their conclusions based on the their chosen methods, and it remains to be seen exactly why EFL learners like or dislike the study of English based on the fact that there are so many independent variables involved when studying individual attitudes toward learning the language.

English has become the world's most widely taught language (Kachru & Neslon, 2001) and is generally thought to be relevant for future work (Wordell, 1985), but opinions on this are divided. Morita (2013) observed two schools of thought among students regarding future need of English. Some believed that it would be truly useful to help them communicate within a globalized society, while others considered it merely a hoop to jump through (e.g. receiving an adequate TOEIC score for a job). The truth of the matter is that low English ability will usually not disqualify you from a job in Japan (Nakamura, 2014), and while the government may outwardly project a positive mindset for the advancement of English learning, there is still much apprehension in implementing and following through with policies to develop English ability to increase globalization (Reesor, 2002).

While the need for English in Japanese workplaces may be disputed by some, English for Specific Purposes (ESP) has been gaining momentum in the last decade. Most English curricula, however, continue to offer basic English programs that will most likely not benefit those planning for a career in a specialized profession (Khan, 2017). This is especially relevant to the study of pharmaceutical science, where 80% of research published is in English, making it a de facto *lingua franca* (van Weijen, 2012).

Students seem to recognize this importance. Responses from a study by Kawano, Skier, Takeuchi, Horiuchi, and Kaneko (2013) showed that when English was combined with content, both students and teachers perceived the combination to be effective and felt that materials which were authentic did not require much simplification.

Having the skill to work and communicate in a second language doesn't necessarily mean that it will be necessary to do, but the literature seems to point in the direction that Japan should at least try to promote a policy where its citizens have a basic ability to communicate in English, especially in the workplace. In a multi-national comparative study comparing pharmacy practices, Japan was found to be unlike other countries in terms of how pharmacists communicate with patients (Inoue et al, 2015). The researchers felt that in the future, pharmacists in Japan should communicate more with patients about their health, beyond the simple dispensing of drugs. If such practices do emerge, then pharmacists may find it advisable to facilitate some channel for English communication, as both tourism and immigration are expected to rise in the coming years (Morita, 2017; Menju, 2017).

Studies have shown varied results as to which English skill or skillset is most important since each setting will demand its own unique language needs. Of the four main skills (reading, writing, listening and speaking), reading has long been the one most focused on in second language learning (Robb & Susser, 1989). Many studies support this assertion, often in combination with one or more other skills. For academic study, university students tend to feel that both reading and listening are the most important (Christison & Krahnke, 1986), probably due to the necessity of those two skills in navigating both textbooks and class lectures. Additionally, the TOEIC exam, which is required for employment by many companies in Japan, and is reading- and listening-focused, may also be partially responsible for these two skills being perceived as important. In a study by Kaneko, Rozycki, and Orr (2009), workers in the fields of science and technology responded that they considered reading and writing to be most valuable, as workers in those fields interact with reference materials, e-mails and faxes often written only in English. Respondents in that same study also felt that speaking and listening skills were not as important because they are not encountered as much.

There has been a recent push, however, to move from text-based skills to those that are socially communicative and interactive. As English becomes more prominent in the Japanese workplace, it will require workers to have better oral skills for communication both with customers and fellow workers (Neeley, 2017; Morita, 2017). Spence and Liu (2013) argue that as workers advance in their careers, the need for English, particularly in the area of oral skills, increases. Foong, Wajima, Matsuno, Hasegawa, and Ogasawara (2015) noted that pharmaceutical students who were enrolled in classes focusing on English oral presentations found those classes to be meaningful, interesting, and significant to their field.

Methods

Participants and Context

The participants were 79 first- to fourth-year students majoring in pharmaceutical science at a medium-size international university in Chiba, Japan. Of these, 27 were first-year students, 30 were second-year students, and 22 were third- and fourth-year students. Participants were chosen based on class year and how the class schedules matched the researcher's schedule. Three separate classes fit the parameters and were selected for the study (Table 1). All participants were Japanese and spoke Japanese as their first language. Students in the Faculty of Pharmaceutical Sciences are required to take three English classes for six credits during their first two years, with an additional elective English class offered to third- and fourth-year students. The compulsory English classes offer basic oral communication and four-skill development, whereas the elective class focuses on language and situations encountered in pharmacy work. While levels vary, students from this faculty generally score better on the university's English placement test and are reported as being higher in both proficiency and overall academic diligence by their English instructors when compared to those from other faculties.

Materials and Procedure

In each class, a 32-item Likert-based paper survey instrument written in Japanese was distributed during the last week of regular classes in July 2019. Of the 32 items on the survey, 24 were used for this study. The remaining eight items were used for a concurrent study. Participation was voluntary, and those who chose to participate signed consent forms (in Japanese) explaining the purpose and details of the study. The researcher briefly outlined the contents of the consent form orally, in Japanese, and then collected the consent forms. The survey was distributed to the participants and the researcher explained that for each item they should mark the box that most closely matched their feelings for that item. Participants completed the survey in under ten minutes by marking their answers for each item on the Likert scale with a pen or pencil. The researcher collected the surveys and ended the activity.

Limitations

Although the surveys were anonymous and participants were assured that their responses would in no way affect their class scores, the self-reported nature of the collected data presents the risk that participants may have responded to items according to how they thought the researcher wanted them to answer. Also, while grouped items showed high levels of reliability using Cronbach's alpha (see Tables 1-2) and the instrument itself passed face validity, the number of participants sampled may not be enough to accurately reflect the larger population.

Results

   The collected data was analyzed and arranged into three data sets (Tables 1-3) which corresponded to the research questions. For the first data set (Table 1), which dealt with general feelings about their current English study, participants most agreed that studying English made them feel more confident in themselves (*fx*=65). They disagreed most when asked if they studied English every day (*fx*=-81). While 57% responded that they enjoyed studying English, 52% said their other classes kept them too busy to study English. Many considered their other classes to be more important (40%), with only 9% saying otherwise. Less than one-third (28%) stated that they didn't like English because it was too difficult. They also reported that studying English was not stressful or boring, with only 16% and 12%, respectively, saying that it was. If given the choice, 25% said they would not study English if it was not required.

Table 1. *Survey Frequencies and Related Statistics for Data Set 1*

Question	n	Strongly Disagree (-2)	Disagree (-1)	No Opinion (0)	Agree (1)	Strongly Agree (2)	a	fx	X̄	SD
1) I enjoy studying English	79	4%	9%	30%	41%	16%	0.98	45	0.57	1.00
4) I don't like studying English because it is too difficult.	79	11%	27%	34%	23%	5%	0.98	-13	-0.16	1.07
6) My other classes are more important than my English classes.	79	1%	8%	52%	32%	8%	0.97	29	0.37	0.79
9) My other classes keep me too busy to study English.	79	3%	15%	30%	38%	14%	0.98	36	0.46	1.00
10) I would not study English if it was not a compulsory subject in school.	79	10%	27%	38%	19%	6%	0.98	-12	-0.15	1.05
18) Studying English makes me feel more confident in myself.	79	0%	8%	24%	47%	22%	0.97	65	0.82	0.86
19) It is stressful for me to study English.	79	9%	28%	48%	13%	3%	0.98	-22	-0.28	0.89
20) Studying English is boring.	79	11%	38%	39%	9%	3%	0.97	-37	-0.47	0.90
22) I study English almost every day.	79	22%	65%	10%	2%	1%	0.98	-81	-1.03	0.73

The second data set (Table 2) asked participants about the extent of the role that English might have in their future profession. In this set, participants showed the highest level of agreement for question item 16, when they replied that English would help them to become better in their future work (*fx*=76*)*. Nearly 70% thought that English would be important for their future work, with over half expressing the feeling that English would be more important than other languages (56%). They most disagreed with the idea of refusing a job that required them to use English (*fx*=-23), with 52% reporting that they really didn't know if they would accept or refuse a job based on English requirements. A high degree of indifference was also shown when asked if they believed they would use English in their work (58% had no opinion), or if English would improve their chances of getting a job (49% again selected "no opinion").

Table 2. *Survey Frequencies and Related Statistics for Data Set 2*

Question	*n*	Strongly Disagree (-2)	Disagree (-1)	No Opinion (0)	Agree (1)	Strongly Agree (2)	*a*	*fx*	$\bar{X}$	SD
3) In my future work, English will be important.	79	3%	10%	18%	53%	16%	0.97	56	0.71	0.95
7) I would not accept a job if I needed to use English.	79	9%	27%	52%	10%	3%	0.96	−23	-0.29	0.86
13) In my future work, English will be more important than other languages (not including Japanese).	79	4%	10%	33%	37%	16%	0.97	41	0.52	1.01
14) I will have a better chance of getting a job in my profession if I can use English.	79	6%	11%	49%	23%	10%	0.96	15	0.19	0.99
16) Studying English will help me become better in my future work.	79	1%	4%	23%	42%	30%	0.96	76	0.96	0.90
21) I will use English in my future work.	79	4%	6%	58%	25%	6%	0.97	19	0.24	0.82

In the third data set (Table 3), participants were asked how important they thought specific English skills and functions would be for their work. Although listening received the most agreement of the four main skills (*fx*=152) with 74% rating it as either important or very important, 99% thought that reading would have at least some level of importance. 48% viewed writing to be somewhat important, while speaking garnered the most "not important" responses of the four skills (9%).

Understanding technical vocabulary and general conversation were each considered to be very important by 25% of the respondents. Using English to help others was believed to be vital, as it received not only the most "very important" responses, but also the highest agreement score (fx=162). Giving a professional presentation scored the lowest agreement for this data set (fx=88), with 65% saying it was either somewhat important or not important. Also scoring at the low end of agreement (comparatively speaking), was the need for English to communicate with others within the same profession (fx=110).

It should also be noted that the number of "no opinion" responses for all items on the survey decreased as class year increased (see Appendix). 37% of responses made by first-year students indicated that they had no opinion or were neutral. This number dropped to 30% for second-year students and 25% for those in their third and fourth years.

Table 3. *Survey Frequencies and Related Statistics for Data Set 3*

How important will the following English skills and functions be in your future work?	n	Not Important (-1)	Somewhat Important (1)	Important (2)	Very Important (3)	fx	$\bar{X}$	SD
24) Reading	79	1%	34%	41%	24%	147	1.86	0.83
25) Writing	79	6%	48%	39%	6%	110	1.39	0.87
26) Listening	79	6%	20%	42%	32%	152	1.92	1.05
27) Speaking	79	9%	24%	44%	23%	136	1.72	1.10
28) Giving professional presentations	79	18%	47%	24%	11%	88	1.11	1.19
29) Understanding technical vocabulary	79	4%	33%	38%	25%	143	1.81	0.95
30) General English conversation	79	3%	27%	46%	25%	151	1.91	0.87
31) Communicating with others in my profession	79	11%	43%	29%	16%	110	1.39	1.13
32) Helping others (e.g. customers, patients, etc.)	79	4%	19%	42%	35%	162	2.05	0.95

Discussion

Based on the information gathered in the literature review, it would be prudent for students planning for a career in pharmaceutical work to recognize the potential importance of English ability in their future careers. Looking at the results, the three research questions presented earlier can now be addressed.

Research question 1: What perceptions do pharmaceutical science students have about their English study?

Participants felt strongly about the self-perceived confidence gained from studying English. This might seem contradictory to those who deal with classrooms in Japan full of students unwilling to engage communicatively. The vagueness of what it means to "be confident" may play a role here in that confidence might increase when students understand something they didn't before or if they receive a good score on a test. With so many variables contributing to learner confidence, it is difficult to know exactly what led to the participants' favorable views.

Nearly 90% of the participants basically admitted that they did not study English every day. However, looking at the other data, it is understandable why this might be true. They did seem to consider their other classes to be more important than their English classes and stated that those other classes prevented them from studying English. The rigorous six-year program which students in the faculty must complete most likely does not lend much time for other academic pursuits.

Over half of the respondents said that they enjoyed studying English, and a significant minority explicitly disagreed with feeling bored or stressed. They also didn't feel the difficult nature of studying English interfered with their enjoyment of the activity. Here again, independent variables are most likely the reason for the opinions given here.

By the time students in Japan begin their tertiary education, they have most likely completed at least six years of English in their secondary schooling, and recent educational reform has mandated that it be taught at the elementary level. Even though a quarter of the participants said they would not study English if given the choice, one-third said that they would, which shows that, even with a demanding academic schedule, there is a desire among many to become more proficient in English.

Research question 2: To what extent do pharmaceutical science students feel English might affect their future profession?

Why participants thought English would help them to become better in their future professions is unknown. As Japan looks to become a more internationalized country, English competence will be a valuable skill to have. Being able to communicate in another language would probably prove to be beneficial. Considering that English has become the standard for the international pharmaceutical community, students would do well to become at least somewhat proficient in English, especially in the areas of reading, writing, and oral presentation (Edouard, 2010; Tardy, 2004).

Seeing as how English is emphasized throughout their primary and secondary education, it should come as no surprise that the participants would feel English is important for in all aspects of their life, including work. Although a vast majority of non-Japanese living in Japan do not speak English as their first language, the literature suggests that English would indeed probably be the most likely *lingua*

franca used. With English ability being promoted by both the government and, to an extent, the private sector, students should have a better idea as to how big of a role English will play in their future careers before they enter the workforce. The fact that 49% didn't seem to care if English ability would help them get a job, and over half had no opinion about whether they would use English in their work, or even if they would accept a job which had some kind of English requirement, indicates that students are unaware of the reality of English need in the workplace. Higher education institutions would do well to research how important of a role English appears to have in various disciplines and report the findings to the students.

Research question 3: What English skills and functions do pharmaceutical science students think are important for their future profession?

Each of the four main English skills were perceived as having some level of importance. Being that reading and listening are generally the two skills most focused on in their academic life, it seems appropriate that the respondents agreed most that these two skills were important. Reading and knowledge of technical vocabulary also scored similarly, so participants seem to realize that in order to gain vocabulary knowledge they will need good reading skills. Of the four skills, participants showed the least agreement when responding to writing. This is especially perplexing considering the importance that writing has in pharmaceutical research. This hints at the possibility that they are unaware of the need for writing, especially when it comes to conducting research and writing articles. It could also be that they do not plan to enter pharmacy work in an academic capacity and focus instead on practical applications (e.g. dispensing drugs, helping patients, etc.). Speaking received the highest number of "not important" responses, but also the highest number of "important" responses. It could be that when considering speaking, participants were thinking of practical applications (speaking to customers) rather than professional ones (delivering a presentation). This hypothesis is strengthened by fact that giving oral presentations received the highest number of "not important" responses within the data set. Combine this with low agreement that English is important for communicating with others in their field, and we are looking at a group that obviously feels that seemingly valuable English skills will either not be needed for professional development or doesn't plan on pursing such avenues. Even if students are not concerned with the research-side of pharmaceutical work, given the nature of their jobs they will most definitely need to keep up with advancements within their field. This will require them to be familiar with drug studies and current practices. If students expect that English will be important for helping patients and other customers, then why did one-third feel that speaking was only of moderate or no importance? There appears to be a disconnect in the logic, as speaking would be very important when helping others.

Finally, it appears that as students advance in their education, so does their development of opinions.

Each successive class year produced fewer "no opinion" responses. This is encouraging as it shows that students are developing their opinions about English language learning and needs.

Conclusion and Future Considerations.

The literature focusing specifically on the general feelings that pharmaceutical science students have about studying English is limited. The information presented here can hopefully give more insight into how such students perceive their English study experience. If the responses here are truthful and can be applied to the total population, then they provide some interesting information about how students in a pharmaceutical science program feel about their English study:

- A majority enjoy studying English and feel a sense of self-confidence from studying.
- Differing priorities and a taxing schedule may be responsible for the high number of students who say they do not study English every day.
- English does not seem to be boring or stressful for students, and while it may be difficult, it does not hinder their enjoyment of it.
- Even if it was not a required course, there would still be some demand for English education.
- Perceptions about English needs could possibly be shaped by their compulsory and tertiary education.
- Students do not seem to be aware of the growing importance of English in the Japanese workplace.
- Speaking and writing skills are not considered as valuable as reading and writing.
- Based on the results, it seems that students don't expect to be involved with research or professional development after getting a job.

What we see here paints only a rough picture of how pharmaceutical science students feel. Further research into *why* students feel the way they do might clarify some of the perceived discrepancies noted in this study. How students feel about their levels of confidence and what it means to "be confident" would also be worth investigating. Oral interviews with students discussing specifically what role they feel English will play in their future occupations and what skills they think will be necessary could provide a better understanding of what they think the situation is versus the real-world situation. Finally, more research into how independent variables shape beliefs is needed, as those variables have been shown to be so important in language learning success.

References

Abidin, M. J. Z., Pour-Mohammadi, M., & Alzwari, H. (2012). EFL students' attitudes towards learning English language: The case of Libyan secondary school students. *Asian Social Science*, *8*(2), 119.

Ahmed, S. (2015). Attitudes towards English language learning among EFL learners at UMSKAL. *Journal of Education and Practice*, *6*(18), 6-16.

Amaki, Y. (2008). Perspectives on English education in the Japanese public school system: The views of foreign assistant language teachers (ALTs*). Educational Studies in Japan: International Yearbook 3*, 53-63.

Benson, M. J. (1991). Attitudes and motivation towards English: A survey of Japanese freshmen. *RELC Journal*, *22*(1), 34-48.

Burden, P. (2002). A cross sectional study of attitudes and manifestations of apathy of university students towards studying English. *Language Teacher*, *26*(3), 3-10.

Chen, I.M. (1985). Elimination of students' fear towards English learning. In C. Chen, H. Huang, I. Hsiao, J. Kuo, M. Chen, & G. Wang (Eds.), Papers from The Second Conference on English Teaching and Learning in the Republic of China (pp. 87-96). Taipei: The Grane Publishing Co.

Christison, M. A., & Krahnke, K. J. (1986). Student perceptions of academic language study. *TESOL Quarterly*, *20*(1), 61-81.

Edouard, B. (2009). Who cites non-English-language pharmaceutical articles? *The Annals of Pharmacotherapy*, *43*(3), 549.

Fakeye, D. (2010). Students' personal variables as correlates of academic achievement in English as a Second Language in Nigeria. *Journal of Social Sciences, 22*(3), 205-211.

Foong, F.J., Wajima, R., Matsuno, H., Hasegawa, K., & Ogasawara, H. (2015). First-time oral presentation in pharmaceutical science English: Questionnaire feedback from pharmacy students in a Japanese university. *Journal of Academic Society for Quality of Life*, *1*(1), 16-20.

Fujita, R., Terui, M., Araki, T., & Naito, H. (2017). An analysis of the English communication needs of people involved in tourism at Japanese rural destinations. *Journal of Global Tourism Research*, *2*(1), 53–58.

Gardner, R., & Lambert, W. (1959). Motivational variables in second language acquisition. *Canadian Journal of Psychology*, 13.

Hamada, K. (2018, May 3). Why we need globalization. *The Japan Times*. Retrieved from https://www.japantimes.co.jp/ opinion/2018/05/03/commentary/japan-commentary/why-we-need-globalization/#.

Hashimoto, K. (2009). Cultivating "Japanese who can use English": Problems and contradictions in government policy. *Asian Studies Review*, *33*(1), 21-42.

Inoue, Y., Morita, Y., Takikawa, M., Takao, K., Kanamoto, I., & Sugibayashi, K. (2015). Future expectations for Japanese pharmacists as compared to the rest of the world. *Research in Social and Administrative Pharmacy*, *11*(3), 448-458.

Kachru, B.B. & Nelson, C.L. World Englishes. In: Burns, A.; Coffin, C. (Ed.). *Analysing English in a global context*. London: Routledge, 2001. p. 9-25.

Kaneko, E., Rozycki, W., & Orr, T. (2009, July). Survey of workplace English needs among computer science graduates. In *2009 IEEE International Professional Communication Conference* (pp. 1-6). IEEE.

Kawano, M., Skier, E., Takeuchi, F., Horiuchi, M., & Kaneko, T. (2013). English education at schools of pharmacy in Japan: meeting curricular needs through authentic ESP material. *Asian EFL Journal*, *15*(4), 356–365.

Khan, I. A. (2017). Revisiting ESP curriculum for pharmacy: An exploratory analysis of EFL learners. *International Research Journal of Human Resources and Social Sciences*, *3*(7), 406–420.

Kikuchi, K. (2013). 12 Demotivators in the Japanese EFL Context. *Language Learning Motivation in Japan*, *71*, 206.

Kyodo News. (2019, April 16). English level at Japan's secondary schools falls short of government target. *The Japan Times*. Retrieved from https://www.japantimes.co.jp/news/2019/04/16/national/english-level-japans-secondary-schools-falls-short-government-target/#.

Maftoon, P., & Ziafar, M. (2013). Effective factors in interactions within Japanese EFL classrooms. *The Clearing House: A Journal of Educational Strategies, Issues and Ideas*, *86*(2), 74-79.

Menju, T. (2017). Accepting immigrants is the ultimate key to reviving Japan. *AJISS-Commentary*, 248.

Montano, D. E. & Kasprzyk, D. (2008). Theory of reasoned action, theory of planned behavior, and the integrated behavioral model. In K. Glanz, B. Rimer & K. Viswanath (Eds*.), Health behavior and health education: Theory, research, and practice*. San Francisco, CA: Jossey-Bass, 67-96.

Morita, L. (2013). Japanese university students' attitudes towards globalisation, intercultural contexts and English. *World Journal of English Language*, *3*(4), 31.

Morita, L. (2017). Why Japan needs English. *Cogent Social Sciences*, *3*(1), 1-11.

Nakamura, J. (2014). Workplace English language needs of Japanese business undergraduates. *OnCUE Journal*, *7*(3), 151-167.

Neeley, T. (2017). *The language of global success: How a common tongue transforms multinational organizations*. Princeton University Press.

Reesor, M. (2002). The bear and the honeycomb: A history of Japanese English language policy. *NUCB Journal of Language Culture and Communication*, *4*(1), 41-52.

Reid, N. (2003). Getting started in pedagogical research in the physical sciences. Retrieved from https://www.researchgate.net/profile/Norman_Reid2/publication/242482113_GettingStarted_in_Pedagogical_Research_in_the_Physical_Sciences_written_by/links/540f54010cf2df04e75a2d80.pdf.

Robb, T. N., & Susser, B. (1989). Extensive reading vs. skills building in an EFL context. *Reading in a Foreign Language*, *5*(2), 239-251.

Ryan, S. (2009). Ambivalence and commitment, liberation and challenge: Investigating the attitudes of young Japanese people towards the learning of English. *Journal of Multilingual and Multicultural Development*,

30(5), 405-420.

Spence, P., & Liu, G. Z. (2013). Engineering English and the high-tech industry: A case study of an English needs analysis of process integration engineers at a semiconductor manufacturing company in Taiwan. *English for Specific Purposes*, *32*(2), 97-109.

Tardy, C. (2004). The role of English in scientific communication: lingua franca or Tyrannosaurus rex? *Journal of English for academic purposes*, *3*(3), 247-269.

van Weijen, D. (2012, November). The language of (future) scientific communication. Retrieved from https://www.researchtrends. com/issue-31-november-2012/the-language-of-future-scientific-communication/

Visser, M. (2008). Learning under conditions of hierarchy and discipline: The case of the German Army (1939-1940). *Learning Inquiry. 2*, 127-137.

Williams, K. E., & Andrade, M. R. (2008). Foreign language learning anxiety in Japanese EFL university classes: Causes, coping, and locus of control. *Electronic Journal of Foreign Language Teaching*, *5*(2), 181-191.

Wordell, C. B. (Ed.). (1985). A Guide to teaching English in Japan. Tokyo: *The Japan Times*.

APPENDIX

Raw Frequencies of Survey

Question	n	Strongly Disagree (Class year)			Disagree (Class year)			No Opinion (Class year)			Agree (Class year)			Strongly Agree (Class year)		
		1	2	3-4	1	2	3-4	1	2	3-4	1	2	3-4	1	2	3-4
1) I enjoy studying English.	79	1	2	0	2	3	2	13	9	2	9	11	12	2	5	6
2) English is not important for my life.	79	4	7	5	12	15	13	8	6	3	3	2	1	0	0	0
3) In my future work, English will be important.	79	1	1	0	5	1	2	5	4	5	12	18	12	4	6	3
4) I don't like studying English because it is too difficult.	79	3	2	4	5	9	7	9	12	6	8	6	4	2	1	1
5) I want to communicate well in English.	79	1	1	1	0	0	0	5	4	0	11	18	9	10	7	12
6) My other classes are more important than my English classes.	79	0	0	1	1	2	3	10	19	12	11	8	6	5	1	0
7) I would not accept a job if I needed to use English.	79	1	4	2	6	6	9	16	16	9	3	3	2	1	1	0
8) I feel confident using English for everyday conversation (not work-related)	79	17	17	12	6	9	3	3	3	6	1	0	0	0	1	1
9) My other classes keep me too busy to study English.	79	0	0	2	2	5	5	8	10	6	12	10	8	5	5	1
10) I would not study English if it was not a compulsory subject in school.	79	0	3	5	2	8	11	11	13	6	11	4	0	3	2	0
11) Japan has a good English education policy.	79	4	9	9	7	9	3	11	10	10	4	2	0	1	0	0
12) My university has a good English curriculum.	79	1	2	0	2	2	10	16	16	9	7	8	3	1	2	0

Statement	N															
13) In my future work, English will be more important than other languages (not including Japanese).	79	2	1	0	1	6	1	16	6	4	6	13	10	2	4	7
14) I will have a better chance of getting a job in my profession if I can use English.	79	1	3	1	1	6	2	18	10	11	2	9	7	5	2	1
15) I feel uncomfortable when I must communicate in English.	79	1	2	1	1	1	5	4	4	1	12	11	12	9	12	3
16) Studying English will help me become better in my future work.	79	0	1	0	0	3	0	6	5	7	13	15	5	8	6	10
17) I am not satisfied with my current English ability.	79	0	0	0	2	0	0	2	5	1	12	15	6	11	10	15
18) Studying English makes me feel more confident in myself.	79	0	0	0	2	3	1	10	9	0	10	13	14	5	5	7
19) It is stressful for me to study English.	79	1	3	3	4	10	8	18	11	9	3	5	2	1	1	0
20) Studying English is boring.	79	0	3	6	9	10	11	13	14	4	4	2	1	1	1	0
21) I will use English in my future work.	79	2	1	0	1	2	2	18	16	12	5	8	7	1	3	1
22) I study English almost every day.	79	9	6	2	14	21	16	4	3	1	0	0	2	0	0	1
23) I use English in my everyday life.	79	10	4	9	6	21	10	10	3	2	0	2	1	1	0	0

How important will the following English skills and functions be in your future work?	n	Not Important (Class year)			Not Important (Class year)			Not Important (Class year)			Not Important (Class year)		
		1	*2*	*3-4*	*1*	*2*	*3-4*	*1*	*2*	*3-4*	*1*	*2*	*3-4*
24) Reading	79	0	0	1	9	10	8	11	12	9	7	8	4
25) Writing	79	1	2	2	15	13	10	9	14	8	2	1	2
26) Listening	79	3	1	1	5	8	3	12	12	9	7	9	9
27) Speaking	79	3	3	1	8	7	4	10	16	9	6	4	8
28) Giving professional presentations	79	9	4	1	12	16	9	2	8	9	4	2	3
29) Understanding technical vocabulary	79	1	2	0	13	10	3	6	11	13	7	7	6
30) General English conversation	79	2	0	0	8	10	3	11	14	11	6	6	8
31) Communicating with others in my profession	79	4	2	3	14	16	4	6	9	8	3	3	7
32) Helping others (e.g. customers, patients, etc.)	79	2	1	0	9	3	3	11	15	7	5	11	12