Machine Translation and English Education in Japan

Tom GALLY

An Unexpected Advance

In late 2016, the quality of the translations between Japanese and English provided online for free by Google improved suddenly and significantly. Until that time, machine translation (MT) between these two languages had been of limited use: when fed natural texts—that is, texts that people had written to communicate directly with other people, without prior editing to make the texts more easily translatable by computer—MT often produced incomprehensible gibberish. The poor quality of MT had persisted, with limited improvement, for decades. Many people, including this author, were doubtful that MT would ever be broadly applicable, especially for languages as different as Japanese and English.

The recent advances in MT[1] suggest that this pessimism was misplaced. While MT can still fail, especially when the input text contains semantic or syntactic ambiguities, the output is now good enough for many practical purposes. People who need to read or write something in a second language are increasingly using MT to translate to and from their first language rather than struggling with the second language directly. The ready availability of such translation tools has profound implications for many fields and endeavors, including English education in Japan.

Although Japanese is the national language of Japan and the only language needed in daily life by the majority of Japanese people, English is taught to all children in Japanese schools, with each child spending hundreds of hours in English classes and self-study before entering high school. Nearly all children con-

tinue studying the language in high school, and most college and university programs require students to take English classes as well. Many adults also study English, either on their own or in adult-education schools or programs. One of the main justifications for devoting so much time, effort, and resources to trying to learn this foreign language is to be able to communicate in English with people from other countries. That justification, however, is weakened if MT enables such communication to be done easily, effectively, and in many languages in addition to English. Practical communication, however, is not the only reason for the widespread study of English. It has also been justified as a way for Japanese people to gain insight into other countries and into their own culture and language as well as a way to internationalize the once-isolated country. The process of rigorous English study itself has been said to be a beneficial mental exercise, especially when emphasis is placed on grammar and on translating between English and Japanese. These latter justifications might be affected less by improved MT.

To understand better the possible future impacts of improved MT for English education in Japan, this paper examines the main justifications that have been given for universal English education in Japan and discusses the implications of MT's advances for each of those justifications. To illustrate how the justifications have been asserted and assumed, the author has selected three representative contexts: controversies about English education that arose in the 1920s and 1970s and that still resonate today, and the most recent version of the government's Course of Study, or standard curriculum guidelines, for junior-high schools. As the improvements in MT seem likely to transform attitudes toward the utility and necessity of studying other languages, it is hoped that this paper will offer a useful starting point for further discussion and debate among educators, policymakers, and the general public about how to deal in the years ahead with this new and rapidly developing technology.

Why Teach English?

English has been taught to all Japanese schoolchildren for so long that it might seem unnecessary to ask why. But the reasons are not completely obvious, especially to the children them-

selves. While Japanese children usually begin studying English systematically at the start of junior-high school, at age twelve,[2] most have little or no need for English outside the classroom. In fact, for the large majority, Japanese is the only language used at home or in the community. If another language is used around the children, it is more likely to be Chinese, Korean, Tagalog, or Vietnamese than English.[3] It might not be an exaggeration to claim that, for many children, the main immediate need for English is to be able to read "Men" and "Women" signs on public restrooms.

Since immediate practical use is not a viable justification for teaching all children English, a variety of other reasons have been offered, both explicitly and implicitly. These reasons can be divided roughly into two categories, which provide a useful framework for considering the potential impacts of MT on English education in Japan. The first, in Japanese, is called *kyōyō*, which can be translated as "general knowledge and character development." Arguments for *kyōyō* as a reason for teaching everyone English emphasize the personal benefits that systematic study of the language supposedly confers on children in both the short and long term. The second category of reasons, called *jitsuyō*, refers to the use of the language for practical purposes. Because school-age children do not, for the most part, need English right away, the arguments for *jitsuyō* focus on children's future potential need to use the language. It should be noted that these two positions are not mutually exclusive: advocates of placing primary emphasis on *kyōyō* also tend to accept *jitsuyō* as an additional valid reason and vice-versa.

The most historically rooted reason for learning foreign languages in Japan seems to have been *jitsuyō*: to acquire knowledge from abroad. The first language to play this role was Chinese, which was introduced to Japan about fifteen hundred years ago and was the medium for the adoption of legal codes, religion, and writing itself from the Asian mainland. During the Edo Period (1600–1867), when Japan was cut off from most of the world and foreign trade limited to merchants from China and Holland, the Dutch language was studied as a way to acquire knowledge from Europe about science, technology, medicine, geography, and other subjects. Dutch was also the medium by which Japan's leaders learned about recent events in the wider

world. Japan's opening to the world in the second half of the 19th century led to a further blossoming of foreign-language study, especially of German, French, and English, as the country hurried to catch up with Western powers economically, militarily, and culturally.

Although the main reason for learning foreign languages was thus initially utilitarian, or *jitsuyō,* as foreign languages came to be taught widely in schools and universities the reasoning shifted. Even with Japan's opening to the world, most students did not have an immediate need to read texts in English or other foreign languages, and important texts soon became available in Japanese translation. By that time, however, the teaching of English and other languages had become entrenched in the educational system, and an additional, *kyōyō* justification emerged: that studying foreign languages, especially English, benefitted students in their personal and intellectual development.

Fujimura's Attack and Hoashi's Defense

An example of such a *kyōyō*-based argument can be seen in a rejoinder to a much-quoted polemic published in the May 1927 issue of the magazine *Gendai*. Written by Fujimura Tsukuru, a literary scholar and professor at Tokyo Imperial University, the piece was titled "The Urgency of Eliminating English Courses"[4] (Fujimura, 1927). Fujimura lamented the vast amount of time devoted to studying foreign languages at the middle-school level (approximately ages 12 to 16). Because most students would not actually need English in the future and did not acquire sufficient ability to use it for most practical purposes, he advocated eliminating the language requirement and called instead for establishing a national agency that would take over the task of translating texts written in other languages into Japanese. Fujimura's argument was thus *jitsuyō*-based: he assumed that the only reason to study English was as a practical tool; if young people either did not actually have a need for this tool or would not become proficient enough to use it, then they should not have to study English.

The *kyōyō* rejoinder, published in *Gendai* two months later, was written by Hoashi Riichirō, an American-educated philosopher and professor at Waseda University (Hoashi, 1927). Hoashi

based his argument in favor of English study on arguments for education in general. He rejected the notion that practicality should be the only, or even the main, reason for teaching any subject in the general school curriculum. The purpose of education, he wrote, was to impart "wide, varied interests and *kyōyō*" (p. 277). In the case of foreign languages, he emphasized in particular the study of literature, which he called "the richest material to study in order to build humanistic *kyōyō*" (p. 277). Rejecting Fujimura's claim that the need for knowledge from abroad could be met with a centralized translation service, Hoashi wrote that people can appreciate literature only when they read it in the original language. Hoashi also asserted that studying other languages benefits students' character development by exposing them directly to knowledge and ideas from the wider world.

The Hiraizumi-Watanabe Debate

In the Fujimura-Hoashi dispute, the division between *jitsuyō* and *kyōyō* was clear, with Fujimura writing from *jitsuyō* assumptions and Hoashi advocating for *kyōyō*. These two concepts can be seen in a similar debate about the purpose of English education that took place nearly five decades later, but the battlelines were drawn differently. In 1974, the politician Hiraizumi Wataru wrote a proposal for comprehensive reform of English education in Japan (Hiraizumi, 1974). Since most Japanese students would not need English in their later lives and, despite years of study, did not actually become proficient in English in any case, he advocated offering intensive English courses only to the students who wanted to study it. Under his proposal, the junior-high-school English requirement would be replaced with a short *kyōyō* course on the languages and cultures of the world, and the English component of university entrance examinations would be eliminated. By recognizing the personal-enrichment benefits of exposure to foreign languages, Hiraizumi took a *kyōyō* stance like Hoashi's. But, like Fujimura, he also based part of his argument on *jitsuyō* assumptions, as he argued for the elimination of the English requirement in schools based in part on the lack of practical need.

Hiraizumi's proposal attracted a harsh rebuttal from Watanabe Shōichi, a scholar of English literature and conservative

polemicist. Writing in the April 1975 issue of the magazine *Shokun!,* Watanabe insisted on giving priority to what he described as the traditional Japanese purpose for learning foreign languages—"reading original texts accurately" (Watanabe, 1975, p. 29)—which he traced back to Prince Shōtoku's reading and annotation of Chinese versions of Buddhist sutras in the late sixth and early seventh centuries. This focus on close reading of original texts, he argued, was the foundation for the study of Chinese texts during the Edo Period and for the translation into Japanese of texts in English and other European languages in the Meiji Period and later. Watanabe's argument had a *jitsuyō* basis, as he regarded reading ability as useful for the practical purpose of learning from overseas, but he also recognized the *kyōyō* benefits of reading foreign literature in the original (p. 34).

Another component of Watanabe's argument was that the traditional focus on translation in language education brought benefits beyond understanding the language being studied: Japanese students who learn English by translating to and from Japanese, he claimed, also became more proficient in their first language (pp. 35–36). He also argued that the process of translation itself, as well as that of grappling with the rules of English grammar, was "a martial art requiring the ultimate mental exertion" and thus benefitted students' cognitive development (p. 35). These arguments also have both *kyōyō* and *jitsuyō* aspects, as improved first-language ability and sharper reasoning abilities would presumably both enrich children's personal character and enable them better to achieve more in the future.

Official Reasons

Aside from arguments about whether English *should* be taught to all children in Japan, one possible answer to the question of why English *is* taught to all children is simple: the teaching of English is required by law and by government regulation. Article 26 of the Constitution of Japan mandates education for all children in Japan and states that "All people shall have the right to receive an equal education correspondent to their ability, as provided by law." Laws such as the Basic Act on Education and the School Education Law describe in general how that education should be provided, and the education ministry issues detailed, subject-by-

subject standards, called Courses of Study, that all schools in Japan are expected to follow when preparing their curricula. One of those Courses of Study is titled "Foreign Languages," though in fact it deals almost exclusively with English.

The most recent Course of Study for junior high schools was issued in March 2017. The ten-page section on foreign languages describes both the general goals for English education and the individual linguistic and pragmatic points that must be taught (Ministry of Education, Culture, Sports, Science and Technology, 2017a). A few months later, a much longer document explaining the Course of Study in depth was issued (Ministry of Education, Culture, Sports, Science and Technology, 2017b), and it is in the latter document that both *jitsuyō* and *kyōyō* arguments for the teaching of English can be seen. An example from the *jitsuyō* side is "With the rapid progress of globalization, the ability to communicate in foreign languages is expected to be necessary in a variety of situations throughout people's lives rather than, as previously, being limited to only some industries or types of work" (p. 5). On the *kyōyō* side, the document also mentions goals such as "further fostering qualities and capabilities such as thinking ability, judgment ability, expressive ability, etc. and the ability to engage in study, the students' personal character, etc." (p. 6) and the importance of learning about the "culture behind the foreign language" (p. 10). The inclusion of both *jitsuyō* and *kyōyō* justifications in the most important official statement of educational policy—a policy that, while often criticized, does attempt to reflect a broad consensus about the goals that can and should be pursued for English education in Japan—shows that both justifications must be considered when thinking about the future impacts of MT.

Other Justifications?

Before we consider the possible impacts of MT, however, brief mention must be made of two additional reasons why Japanese children all study English: testing and inertia.

For most children, and quite a few adults, the immediate motivation to study English is strictly neither *kyōyō* nor *jitsuyō* but rather to score highly on tests. Nearly all high schools and universities include English in their entrance exams, and many

companies consider scores on standardized tests such as TOEIC or EIKEN when making decisions about hiring, salaries, and promotions. While the testing culture in Japan sometimes seems to be its own justification, with people studying for tests because they like studying for and passing tests, the primary reasons for the great emphasis on English-language testing in Japan are, one hopes, similar to the justifications given for teaching and learning English—that is, to evaluate test-takers' practical skills (*jitsuyō*) as well as their general knowledge and ability (*kyōyō*). Whatever impacts MT might have on the *kyōyō* and *jitsuyō* justifications should, directly or indirectly, apply to testing as well.

Inertia is simply the argument that English should continue to be taught because English has always been taught. While seemingly less rooted in principle than the other justifications, this argument is in fact made explicitly in the explanation of the government's 2017 Course of Study, which states that English is the foreign language taught in almost all schools not only "because English is used worldwide as a means of communication" but also "because it is English that has been studied until now in almost all schools" (p. 97).

As a practical reason for teaching all children English, the inertia argument is powerful. Even if MT were to obviate most *jitsuyō* reasons for learning English, and even if people came to believe that the *kyōyō* benefits of learning English could be obtained through the study of other languages or subjects, the slow pace of curricular reform, the entrenched interests of English-language educators, and the widespread cultural assumptions about the importance of studying English mean that the language will likely continue to be taught in schools and universities for decades, just as Latin remained a central part of school curricula in the West long after its utility had nearly disappeared (Gally, 2012).

In principle, however, inertia is an extraordinarily weak reason to keep teaching English to everyone. Children, in particular, would be unconvinced by the assertion that they should study English just because everyone has always studied English, especially if they can see that adults have come to rely on MT for practical purposes. Adults, too, would increasingly resent having had to devote so much of their youth to a language for which they see little or no need. It is already difficult to motivate chil-

dren in Japan to study English; MT is likely to make it even more challenging.

The Implications of Machine Translation

Since at least the 1920s, major discourses about why English should be taught to all Japanese children have framed the language both as a practical tool and as a means for personal enrichment. In disputes about the purpose of English education, some advocates, such as Fujimura and Hoashi, have tended to take one side of the argument. Others, such was Hiraizumi and Watanabe, have argued from both perspectives. While government education policy, as shown by the most recent Course of Study and its exegesis, has focused on practical communication, it has also continued to value liberal-education principles. When considering how continued advances in MT might affect English education in Japan, one should thus look at possible impacts on both types of justification.

The development of usable machine translation systems marks a watershed for second-language learners and users. While previous technological advances, such as audio and video recording, electronic dictionaries, and Internet search engines, streamlined language learning to some extent, in order to understand and be understood by speakers and writers of another language one still had to go through the arduous process of studying and practicing that language's grammar and vocabulary. MT is now beginning to enable this understanding and being understood using only one's first language. This advance raises the question of whether it will be worthwhile anymore to require most children to devote years to studying and practicing a second language, especially if the language is, like English in Japan, a foreign tongue for which most people have little or no use in daily life.

The implications of improved MT for English education in Japan therefore seem most profound for practical, or *jitsuyō*, purposes. In the 1920s, for example, Fujimura Tsukuru assumed that the purpose of learning English was to obtain information from texts written in English; if Japanese translations of those texts were available, he wrote, then there was no reason to study English. As MT becomes able to produce translations close in quality

and accuracy to that produced by human translators—and much more quickly and cheaply—then Fujimura's argument in favor of eliminating the English-education requirement becomes stronger.

Today, of course, reading to acquire information is not the only practical reason given for Japanese people to learn English; the need to speak, understand, and write the language in order to interact with people who do not know Japanese is also used to justify universal English education. However, MT software is already making it possible for people who do not share a common language to communicate with each other in both speech and writing. As the accuracy of MT continues to improve, and as people learn how to use it effectively, the arguments for requiring all Japanese children to spend hundreds or thousands of hours trying to acquire communicative ability in English become weaker and weaker.

In contrast, the *kyōyō* arguments for studying English seem, at first glance, more impervious to MT's advances. The value of reading English-language literature in the original, as pointed out by Hoashi, is not diminished by the availability of translations, whether human- or machine-made. Similarly, MT would have no effect on the benefits to one's personal development of being able to understand English-speaking countries and cultures directly rather than through translation. Watanabe's argument about the cognitive benefit of learning English grammar and about students' increased awareness of Japanese if they have to translate to and from English would also continue to hold, as would the points in the Course of Study about fostering thinking ability or personal character. English educators worried about MT's threat to their jobs might therefore seem well advised to try to protect their status by emphasizing *kyōyō* arguments for English's central role in school curricula.

But *kyōyō* arguments for the universal teaching of English are also threatened by MT, because every argument in favor of studying English applies *mutatis mutandis* to the study of other foreign languages. A Japanese child would presumably benefit just as much by learning to read Chinese literature in the original, by struggling with the grammar of Arabic, or by translating between Russian and Japanese. The *kyōyō* arguments put forward by people like Hoashi or Watanabe assume implicitly that

it is valuable for Japanese children to study English not only for its own sake but also because English is an international *lingua franca*. As people throughout the world increasingly use MT to communicate across language barriers for work and personal purposes, English's role as a *lingua franca* will diminish. While many individuals will continue to gain valuable knowledge, insights, and discernment from devoting years to studying foreign languages, the arguments for teaching all Japanese children English for almost all of their school years will become increasingly untenable.

Notes

1. These and related advances are explained in layman's terms in Lewis-Kraus (2016) and the article "Finding a voice" (2017). A detailed technical explanation appears in Wu et al. (2016). While it is impossible to predict how quickly MT will continue to improve, the shift from statistical to neural MT described in these sources seems to have broken through some stubborn barriers that had been inhibiting MT's progress. Continued advances in other areas of artificial intelligence are likely to benefit MT as well. The discussion in this paper therefore assumes that MT will become increasingly useful in the years ahead for both written translation and spoken interpretation.
2. Beginning in 2020, regular instruction in English will start two years earlier, in the fifth grade of elementary school (age 10).
3. This assertion is based on the citizenships of resident foreigners and on the countries of origin of foreigners entering the country. At the end of 2016, there were 843,740 resident foreigners who were citizens of China (including Hong Kong), 106,979 of Taiwan, 527,077 of South Korea, 271,969 of the Philippines, 203,653 of Vietnam, and 183,583 of Brazil, compared with 94,447 citizens of the United States, 38,900 of Australia, and 25,890 of the U.K. (Statistics Bureau, 2017b). The number of foreigners entering Japan for stays of 90 days or less in 2016 were 5,980,210 from China and Hong Kong, 3,892,262 from Taiwan, and 4,890,620 from South Korea, compared with 1,152,686 from the U.S., 418,722 from Australia, and 260,785 from the United Kingdom (Statistics Bureau, 2017a). While citizenship does not, of course, correlate completely with language spoken, the overall trend matches the experience of most people in Japan today: If one overhears someone speaking a language other than Japanese in a public place, it is more likely to be Chinese, Korean, or another Asian language than English.
4. The translations from Japanese of this title and of other titles and quotations are the author's.

References

Finding a voice. (2017, January 5). *The Economist*. Retrieved from http://www.economist.com/

Fujimura, T. [藤村作]. (1927, May). Eigoka haishi no kyūmu [英語科廃止の急務 The urgency of eliminating English courses]. *Gendai* [現代]. Reprinted in Kawasumi, T. (Ed.). (1978). Shiryō Nihon Eigakushi 2: Eigo kyōiku ronsōshi [資料日本の英学史 2　英語教育論争史 The history of English-related studies in Japan 2: The history of English-education controversies] (pp. 251–262). Tokyo: Taishūkan Shoten [大修館書店], 1978.

Gally, T. (2012). Disputes about language teaching, past and present. In Professor Paul Rossiter Festschrift Editorial Committee (Ed.), *West to East, East to West: Studies in the Field of English Education Dedicated to Professor Paul Rossiter on His Retirement* (pp. 25–40). Tokyo: Seibido [成美堂].

Hiraizumi, W. [平泉渉]. (1974). Gaikokugo kyōiku no genjō to kaikaku no hōkō — hitotsu no shian [外国語教育の現状と改革の方向 — 一つの試案 The current state and direction of reforms of foreign-language education: An attempt at a proposal]. Reprinted in Hiraizumi, W. [平泉渉], & Watanabe, S. [渡部昇一]. (1975). Eigo kyōiku daironsō [英語教育大論争 Big argument about English education] (pp. 9–14). Tokyo: Bungei Shunjū [文藝春秋].

Hoashi, R. [帆足理一郎]. (1927, July). Haishi ni wa hantai de aru [廃止には反対である I am opposed to abolition]. *Gendai* [現代]. Reprinted in Kawasumi, T. (Ed.). (1978). Shiryō Nihon Eigakushi 2: Eigo kyōiku ronsōshi [資料日本の英学史 2　英語教育論争史 The history of English-related studies in Japan 2: The history of English-education controversies] (pp. 274–283). Tokyo: Taishūkan Shoten [大修館書店], 1978.

Lewis-Kraus, G. (2016, December 16). The great A.I. awakening. *The New York Times*. Retrieved from http://www.nytimes.com/

Ministry of Education, Culture, Sports, Science and Technology (MEXT). (2017a, March). Chūgakkō gakushū shidō yōryō [中学校学習指導要領 Course of study for junior-high schools]. Retrieved September 15, 2017, from http://www.mext.go.jp/

Ministry of Education, Culture, Sports, Science and Technology (MEXT). (2017b, July). Chūgakkō gakushū shidō yōryō kaisetsu: Gaikokugo hen [中学校学習指導要領解説　外国語編 Explanation of course of study for junior-high schools: Foreign languages]. Retrieved September 15, 2017, from http://www.mext.go.jp/

Statistics Bureau, Ministry of Internal Affairs and Communications [総務省統計局]. (2017a). Kokuseki-chiiki betsu nyūkoku gaikokujin no zairyū shikaku [国籍・地域別 入国外国人の在留資格 Status of residence of foreigners entering the country by nationality and region]. Retrieved September 12, 2017, from http://www.e-stat.go.jp/

Statistics Bureau, Ministry of Internal Affairs and Communications [総務省統計局]. (2017b). Kokuseki-chiiki betsu zairyū shikaku (sairyū

mokuteki) betsu sōzairyū gaikokujin [国籍・地域別 在留資格 (在留目的) 別総在留外国人 Total number of resident foreigners by nationality and region and by status of residence (purpose of residence)]. Retrieved September 12, 2017, from http://www.e-stat.go.jp/

Watanabe, S. [渡部昇一]. (1975). Bōkoku no "Eigo kyōiku kaikaku shian"—Hiraizumi Wataru-shi no kaikaku shian o hihan suru [亡国の「英語教育改革試案」— 平泉渉氏の改革試案を批判する A doomed nation's "attempted proposal for English education reform": Criticizing Hiraizumi Wataru's attempted proposal for reform]. Reprinted in Hiraizumi, W. [平泉渉], & Watanabe, S. [渡部昇一]. (1975). Eigo kyōiku daironsō [英語教育大論争 Big argument about English education] (pp. 15–50). Tokyo: Bungei Shunjū [文藝春秋].

Wu, Y., Schuster, M., Chen, Z., Le, Q. V., Norouzi, M., Macherey, W., … & Klingner, J. (2016). Google's neural machine translation system: Bridging the gap between human and machine translation. arXiv:1609.08144 [cs.CL].