# Technology and Teacher Motivation —How Technology in Japanese EFL Contexts Influences Teachers—

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### $\langle Abstract \rangle$

This research explores the influence of technology in the local Japanese high school English as a Foreign Language (EFL) domain. Two factors examined are the attitudes and behaviors of teachers when technology is introduced or is on the horizon of implementation. The subjects were split almost evenly between native-level speakers of English, and Japanese native speakers. It was discovered that a certain cohort would benefit from additional ICT support in order to maintain or improve their motivation, leading to increased adoption of new methods, showing that managing motivation can accentuate judgmental partiality. The hierarchical work structure in schools was also identified as having importance, and this may go hand in hand with generational bias (for using new tools). A longitudinal, more in-depth study is needed to further develop this study.

#### 1 Introduction

In classrooms around the world, technology plays an important role in learning. During the Covid-19 pandemic, we saw that role expand in an unprecedented way as classrooms turned into digital spaces and e-learning became the standard. However, in Japanese schools, it wasn't until the pandemic forced schools to close and teachers to find a new way to deliver lessons that technology rose to the same level of usage as in Western schools. Suddenly, Japanese teachers found themselves struggling to learn how to use platforms such as Google Classroom and YouTube with little to no training or preparation, with consequent effects on their motivation. Yet, after that period was over, it was noticed that many were continuing to use digital resources by their own choice, indicating that they may have come to view them as a valuable tool to add to their teaching repertoire.

The goal of this study was to uncover how using technology affected the motivation of EFL teachers in the Japanese public-school system. Motivation can be defined as "why people decide to do something, how long they are willing to sustain the activity, and how hard they are going to pursue it" (Dörnyei & Skehan, 2003, p. 614). According to Liu (2020) and Hiver et al. (2018), this includes a multifaceted, dynamic pool of factors and influences in subjects' personal and professional lives. This study examines these factors by asking two questions:

1. How are EFL teachers' attitudes influenced by technology?

2. How are EFL teachers' behaviors influenced by technology?

#### 2 Literature Review and Significance

## 2-1 Linking Teachers' Attitudes and Technology Adoption

Studies in recent years have addressed the relationship between teachers' beliefs and attitudes and their use of technology in educational practice (e.g., Afshari et al. 2009; Alberola-Mulet et al. 2021; Makhlouf & Bensafi, 2021; Tondeur et al. 2017; Wang 2021), with most finding teachers have a generally positive attitude towards the use of technology in their educational practice. Alberola-Mulet et al. (2021) found that teachers saw value in the integration of technology into the classroom and that using technology in their teaching had significance and improved the quality of education. Two models have been developed to explore this relationship further. Davis, Bagozzi, and Warshaw (1989) introduced the Acceptance of Computer Technology model which purports that the teachers' perceptions of how useful technology is and its ease of use leads to the development of attitudes and eventually behaviors. Another model is the TPACK model, the Technological Pedagogical Content Knowledge model (Mishra & Koehler, 2006). TPACK measures teacher competency in three areas: content knowledge; teaching methods and practices; and how to use technology. The research conducted with the TPACK model shows a correlation between high TPACK competencies and acceptance of integrating technology in the classroom.

In 2011, Japan's Ministry of Education, Culture, Sports, Science, and Technology (MEXT) released a new plan for introducing technology into the Japanese school education system to prepare students for living in a more globalized, technological world, yet without adequate training and professional development for in-service teachers to integrating such a plan (PISA 2018) while also disregarding teachers' motivations which included negative views (Harper, 1987, as cited in Makhlouf & Bensafi, 2021). Now, over a decade later, teachers' attitudes toward technology use are shifting to a more positive light as some teachers are retiring and younger teachers who, in general, tend to have more experience with technology are becoming established in their teaching careers.

The focus in this study is on the effect of technology use on the teachers' instructional motivation in a Japanese EFL teaching context. With the onset of the Covid-19 pandemic, the Japanese government decided to close

schools for two to three months, forcing teachers in all subjects to rely on emergency online teaching. Almost overnight, tenured educators found themselves struggling to learn to use the tools they needed to teach in an online context. To echo the findings of Wang's 2021 study, "It comes as no surprise that the teachers who rarely used technology in their personal life did not embrace technology..." There is a need for more specific research in the Japanese context. According to Makhlouf & Bensafi (2021), much of the research regarding teachers' technology use in the classroom has been done in more Western nations with more readily available technological resources, making the research presented by this paper significant as it explores how technology influences teachers in a completely Japanese educational context. Furthermore, this study explores how educators' standpoint must be considered when planning and executing new systems. Tondeur et al. posit that the integration of technology can only be completely understood if teachers' beliefs are given proper consideration (2017). These pedagogical beliefs are directly influenced by a teacher's motivations and have a significant impact on the educational decisions made in the classroom. Furthermore, Ashfari et al. state that personal characteristics may also have an impact on how educators use technology in their classrooms (2009). The current study explores how personal technology use impacts teachers' attitudes and behaviors towards technology.

#### 3 Methodology

#### **3-1** Participants

The participants in this study were eighteen (n=18) English language teachers in Japanese public high schools in Kanazawa, Ishikawa prefecture, Japan. While participants selected were all known to the researcher and working at the same or neighboring high schools, effort was made to have a variety of teachers with different genders, ages, and years of teaching experience. About half of the participants were native English speakers working as Assistant Language Teachers (ALTs) while the other half were native Japanese speakers who learned English as a foreign language starting in junior high school. About half of the participants reported knowing a second or third language other than English and Japanese. About half of the teachers surveyed were over the age of 36, meaning they were likely born before the period where personal computers and Internet access was commonplace in homes. Almost 40% of these teachers had been teaching for over 10 years as of the 2022-2023 school year.

All participants were given a survey to complete via Google Forms (Appendix A) over the course of one week. In addition, 15 to 20-minute interviews (Appendix B) were conducted with three teachers, with the data transcribed and cross-referenced for common themes. The interviews were conducted primarily in English but some translation of Japanese took place concurrently during the interviews for transcription purposes.

#### 3-2 Data Collection/Analysis

The survey used a Likert scale and survey data was collected via Google Forms and exported into Excel to produce the mean and standard deviation for each question. The data was analyzed to discover if different attitudes and behavior had a more positive or negative value, and to compare said values among participants to find common elements or influences. Please refer to Appendix A for the survey questions about attitude (Section 1, Questions 1~10). A summary of the data collected is given in Table 1.

Table 1, Survey Responses: Questions about Attitude, n=18

	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
Mean	3.5	3.3125	1.75	3.3125	3.1875	1.9375	3.125	2.8125	3.0625	1.8125
SD	0.5164	0.7042	0.9309	0.6021	0.8342	0.5737	0.8062	0.6551	0.7719	0.8342

The survey went on to ask questions about behavior (Section 2, Questions 11 to 18), also in Appendix A. The data is summarized in Table 2.

Table 2, Survey Responses: Questions about Behavior, n=18

	Q11	Q12	Q13	Q14	Q15	Q16	Q17	Q18
Mean	2.75	2.375	2.1875	2.1875	3.3125	3.6875	3.5625	3.8125
SD	1.0000	1.0878	1.1673	0.9106	0.7042	0.4787	0.6292	0.5439

Interview data was also examined for common themes that may support data collected from the surveys. Common themes in the interviews included a general satisfaction gained from using technology for teaching and the impact it has on students; concerns for older teachers who may not have technology skills or lack the desire to attain them; the types of technology most commonly used in the classrooms such as Chromebooks, Google Classroom, Kahoot quizzes, etc.; and a desire to receive training on new or different types of educational technology that can be used to improve their instruction.

### 4 Discussion

#### 4-1 Attitudes

Overall, it was seen that teachers' attitudes are positively impacted by the integration of technology in their teaching and work environment. O'Neill, Kreijns, & Vermeulen reported in their 2018 study that out of attitude, behavior, and perceived norms, attitude has the strongest influence on teachers' intentions. This was seen in this study, with values of survey items reflecting positive teacher attitudes, despite some hurdles uncovered during interviews.

In regards to using technology in the classroom, 87% of participants said they enjoyed using technology in lessons. 75% say students were also more motivated when they use tech in class. As for the importance of technology use in teaching, 88% said that using tech for teaching English is important. Interview responses supported that this isn't only for instructional purposes, but also for management. One participant explained that use of Chromebooks has cut back on the amount of paper students and teachers have to manage:

"Some students can't clean up.. Can't file papers [well]. Always teachers... [clean] up papers... dareno wakaranai (I don't know whose this is) the paper is unnamed... but I have no choice but to clean up papers and [put] in the trash box." M1-teacher, 3rd year teacher

88% of participants said that tech helps teachers improve their teaching skills, while 69% believed tech helps students improve their English ability. However, interview responses reveal that other intrinsic or extrinsic factors may prevent motivated teachers from using technology more frequently in their classes. The following responses demonstrate this idea:

"We don't always have tools for teaching the topic we need. Students learn about AI and I want to use it but there is no chance. We don't have this kind of thing." I-teacher, 14th year teacher

"The most difficult point is every teacher uses the same plan using ICT... I [have] taught English only two years, so I can't change my plans easily as I don't have... enough [experience]. But like T-sensei or M2-sensei or some older teachers have a lot of [experience] so it's difficult [for them] to change their plans." M1-teacher, 3rd year teacher

The first quotation is in regards to the lack of resources available to teachers. I-teacher is an experienced

teacher in his late 30s who is skilled at using technology, but often shies away from trying to plan lessons with technology as school doesn't have the necessary tools available. Meanwhile, M1-teacher's second quotation reflects the hierarchical system often present in Japanese daily life. In the interviews, junior teachers expressed concerns about making things more difficult for their seniors (more tenured teachers) by asking them to use technology more often.

One last area that was explored was how teachers cope with stressors caused by the use of technology, which could have a negative influence on their desire to use technology. It was found that 89% claimed they don't feel stressed about using technology in the classroom, and 93% said they feel they have adequate IT support available in their schools. In an interview, one teacher had this to say about feeling stressed:

"I...don't know how to feel because I haven't [gotten] used to it. If [the government] say we have to use it (technology) then we do it because it's our job. I don't think I feel stress, just have to do my job. It's maybe easy for young teachers but older teachers... Maybe they cannot do [it]." F-teacher, 16th year teacher

F-teacher's response above may be indicative of attitudes held by many teachers in Japan. While younger teachers don't feel so much stress due to technology use, older teachers still struggle to implement it in meaningful ways because of their lack of proficiency in technology. The sentiments are also a reflection of the possibility that Japan's teachers are overworked.

#### 4-2 Behaviors

Technology was found to have a positive influence on teacher's behaviors. Two areas were surveyed in regards to behavior. The first was teachers' motivation to improve their knowledge of technology. 56% reported attending some kind of tech-related training or professional development. Only 37% read or watch videos about using tech for teaching outside of work. Furthermore, 88% said they learn to use tech by trial and error, and 75% said they want more training on using technology for teaching.

The second area surveyed was the influence of technology use in their personal lives. 100% of participants reported that they own and use tech outside of work, although only 38% claimed that they regularly purchase new, updated technology. Moreover, 94% use tech to

complete daily tasks as well as for entertainment or recreational purposes.

It is worth noting that further research on the differences between native Japanese teachers and nonnative Japanese teachers may be necessary to determine any possible bias or influence stemming from cultural differences. It may also be worth exploring if the duration of a teacher's career or teachers from different age groups have significant differences. In our study, one participant was over the age of 50, and was the only participant who reported that they do not use technology outside of work for either daily tasks or entertainment purposes. Despite this, this teacher still claimed that they had a positive attitude towards using technology for teaching and that they felt technology was important for education. This finding is significant because previous research has pointed to a negative correlation between age and negative attitudes about technology use (Makhlouf & Bensafi, 2021; Wang, 2021).

## 5 Conclusions, Implications and Limitations 5-1 Conclusions

The current study finds that teachers generally have positive attitudes towards using technology in the classroom and that they are motivated to use technology because of the positive impact it has on student learning. Unsurprisingly, teachers feel less stress about using technology when they feel adequately supported and they want to have more training made available to them. Another significant finding is that teachers view technology as a tool for helping improve their own teaching skills.

Teachers' behaviors are influenced by their knowledge and understanding of technology. Also, their behaviors reflect an interest in technology outside of educational contexts such as for entertainment, reflecting a personal investment and value placed on technology in daily life. Finally, teachers' behaviors reflect a motivated desire to improve their technology skills either through trial and error or furthering their education outside of the work environment.

#### 5-2 Implications

Several important implications for educators and education administrators were discovered by the current study. First, in order to foster and maintain positive teacher motivation for technology use, teachers need adequate support both in the form of ICT support in the workplace as well as access to training and professional development that addresses technology needs and skills. Teachers need opportunities to observe, make reflections, and discuss technology uses in order to truly understand exactly how ICT is a learning tool that applies to their own teaching.

Furthermore, the hierarchical junior-senior system among teachers in Japanese schools needs to be considered when making decisions regarding technology use in classes. In order for younger teachers to have more opportunities to excel, a top-down approach will need to be taken where administrators require more experienced teachers to implement skills or attend training before or at the same time as their younger peers allowing junior teachers to feel comfortable when proceeding with new ideas or skills they have learned.

### 5-3 Limitations

Due to the small sample size, the results may be difficult to generalize. Moreover, the survey and interview

questions could be further refined to provide more in-depth information for analyzing in future studies. Since only survey data and interviews over a short period of time were used for this study, the research lacks perspective that a longitudinal, more in-depth study could provide (Dornyei & Ushioda, 2013).

Another factor to consider is that the English proficiency and cultural differences of non-native English language teachers might restrict their ability to express their feelings. The Japanese participants expressed that it was sometimes difficult to express their true feelings and thoughts even under anonymity. Any further studies in the context of the Japanese educational system will need to find ways to have participants respond more openly.

A final consideration is the possibility of generation bias, which is apparent in the survey results of this study. The topic of the age of teachers and how that affects their motivation, attitudes, or beliefs towards technology use provides its own unique opportunities for research in future studies.

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## Appendix A

Directions: Please read each statement carefully. Circle one response for each statement. The choices range from "Strongly Agree" to "Strongly Disagree". **\*Technology** means any type of electronic device such as Chromebooks or iPads and applications like PowerPoint, Kahoot, YouTube, etc.

Key: SA= Strongly Agree, A= Agree, D= Disagree, SD= Strongly Disagree

#### Section One: Attitude

Overall, I enjoy teaching English.	SA	А	D	SD
I enjoy using technology in my lessons.	SA	А	D	SD
I do not think technology is necessary for teaching English.	SA	А	D	SD
My school supports the use of technology and provides help when I need it.	SA	А	D	SD
My students enjoy lessons more when we use technology in class.	SA	А	D	SD
I feel too stressed when I have to use technology in the classroom.	SA	А	D	SD
I believe using technology for teaching is important.	SA	А	D	SD
I think technology helps students improve their English ability.	SA	А	D	SD
I think technology helps teachers to improve their teaching skills.	SA	А	D	SD
I feel like using technology in class is too troublesome.	SA	А	D	SD

#### Section Two: Behavior

I need more training on how to use technology in my lessons.	SA	А	D	SD
I have attended teacher training or workshops to learn new technology skills.	SA	А	D	SD
I often buy new technology such as PCs, tablets, smartphones, smart watches, etc.	SA	А	D	SD
I often read books, magazines, or websites about using technology for teaching.	SA	А	D	SD
I learn about technology mostly from using it and making mistakes.	SA	А	D	SD
I interact with technology at work every day.	SA	А	D	SD
I use technology outside of work for daily tasks.	SA	А	D	SD
I use technology outside of work for entertainment or to relax.	SA	А	D	SD

**Biographical Information:** Please write your answers below. All information is confidential and used for research purposes only.

- 1. What is your age?
- 2. What is your gender? M or F or NA
- 3. What is your native language? \_

4. At what age did you begin learning English?

- 5. How many years have you been teaching English?
- 6. Do you speak any languages other than Japanese and English?

# Appendix B Interview Items

- 1. How long have you been teaching English?
- 2. Have you ever taught in a different prefecture or type of school (i.e., private school, elementary or middle school)
- 3. How do you feel about using technology in your classes?
- 4. What are some common examples of technology you use in your classes?
- 5. Do you feel like it is easier or more difficult to plan lessons when you use technology?
- 6. Tell me about how you felt when we had to teach online during the Covid-19 pandemic.
- 7. Do you think the tools and technology you used during online teaching are useful in face-to-face classes?
- 8. Do you think that teachers need more training on how to use technology in their lessons?
- 9. How would you feel if the government decided teachers must use technology in all their lessons?
- 10. Do you believe you have an advantage or disadvantage using technology because of your age?
- 11. Is there any technology you wish you could use in your classes that you don't have the time or resources to use now?
- 12. When you have to use technology at work, how does it make you feel?