



## Junior High School Teachers' Perspectives on Integrating Computers in Lessons

Steven Lim

Meikai University

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The Global and Innovation Gateway for All (GIGA) School Program, an initiative by the Japanese government to provide each student in compulsory education with a computing device, was implemented in March 2021. This case study followed two junior high school English teachers for their first year of using the devices. The aim was to discover, through a series of semi-structured interviews, how the devices were integrated into the classroom as well as the participants' beliefs regarding the pedagogical benefits of the technology. Through trial and error, both teachers found applications that suited their pedagogical style, and made extensive use of the technology over the course of the year; one participant utilized the devices to enhance a teacher-centered approach and the other to facilitate a student-centered one. With device programs becoming prevalent around the world, such case studies can contribute to the ongoing collective learning experience.

文部科学省が全国の小中学校の生徒一人一人にパソコンを支給する「GIGAスクール構想」が2021年3月に施行された。本研究は、1人1台端末の導入1年目である中学校英語教師2名に対して追跡調査を行った。その目的は、半構造化インタビューを通じて、コンピュータがどのように教育現場に組み入れられているのか、また、コンピュータがもたらす教育上の利点に関して参加者の見解を明らかにすることにある。2名の教師は試行錯誤の結果、それぞれの教育スタイルに合ったアプリケーションを見つけ、1年の間にテクノロジーを幅広く活用していたことが明らかとなった。1名は教師主体のアプローチの強化、もう1名は生徒主体のアプローチの促進のために端末を活用した。1人1台端末が世界中で普及する中、本研究が継続的な集合学習に貢献することが期待される。

The launch of the Global and Innovation Gateway for All (GIGA) School Program in 2021 meant every student in compulsory education in Japan had access to their own computing device, such as a laptop or tablet. National programs using these devices have become increasingly prevalent worldwide as computers have become faster, cheaper, and easier to use (Clarke et al., 2013). Originally planned for March 2023, the GIGA School Program was brought forward two years from its scheduled launch in response to the COVID-19 pandemic, leaving the teachers who were expected to implement this ambitious program with little training, guidance, or time to prepare.

### Teacher Training

The amount of technology training a teacher receives plays a role in the degree to which they use technology in their classes (Li et al., 2019) and is key to fostering a positive attitude towards technology (Zhao & Bryant, 2006). However, Duhaney (2001) noted that effective teacher-training programs on how to incorporate technology in the classroom can be time-consuming. Further, short-term training programs with no follow-up have been shown to be unproductive (Zhao & Bryant, 2006).

Li et al. (2019) suggested that pedagogical practices should be taught in lockstep with technology training to ensure teachers are fully prepared to integrate technology in their classes. The historic poor rate of adoption of technology among foreign language teachers noted by Liu et al. (2017) may stem from traditional transmissive teaching methods which are at odds with the learner-centered pedagogy promoted by technology-based instruction.

### Support Systems

When given support from their institutions, teachers develop positive feelings towards technology and increase their intention to use it in their classes (Teo et al., 2009). Scherer et al. (2019) suggested that schools have a responsibility to make it easier for



teachers to integrate technology in their classes by providing appropriate resources and conditions to aid them. One-on-one mentoring sessions are critical to helping teachers utilize technology successfully in their classes. According to Zhao and Bryant (2006), in situations where one teacher acts as a mentor, their mentees show greater confidence in their ability to integrate technology in their classes, and to overcome any technical difficulties they may encounter. To facilitate the integration of technology in the classroom, teachers must have the opportunity to practice in a supportive environment as well as to receive feedback and assistance (Li et al., 2019).

### Attitudes Towards Technology

Teachers are critical in determining how successful the integration of technology in the classroom will be (Teo et al., 2009). Perceived ease of use is strongly correlated with self-efficacy (Scherer et al., 2019) which in turn is related to the extent the teacher uses technology in their classes. Teachers who consider themselves competent technology users are more likely to learn new skills than those who lack confidence in their technology proficiency. This has the potential to lead to a widening of the knowledge gap between those who are comfortable using technology and those who are not. Li et al. (2019) posited that in the case of new technology initiatives, some teachers would be willing to improve their skills and adopt a new approach whereas others would try to maintain their usual manner of instruction.

### Purpose of the Study

Teacher training and support systems are vital to incorporating devices in education, but the accelerated implementation of the GIGA Schools Program meant that such systems had not yet been put into place. In addition, a positive attitude towards technology is an important factor in determining the extent to which teachers use these devices. However, since the teachers may not have felt prepared to use the devices, they may have had a negative attitude towards the technology. Due to these factors, it was unknown how teachers would react to the devices, and whether or not the teachers would incorporate them into their pedagogy. This study aimed to address the following research question: How did the launch of the GIGA School Program affect the teaching practices of two Japanese English teachers?

### Method

This was a qualitative study which used semi-structured interviews. The participants were two female Japanese English teachers who were working in public junior high schools for the same board of education in the Kanto region. Both participants taught Year 8 students and both teachers' students were provided with Chromebooks, hereinafter referred to as devices. The teachers, former colleagues of mine, will be referred to by the pseudonyms Sena and Miku. Sena and Miku were invited to participate because, although they had similar teaching situations, they differed in their teaching experience and their attitudes towards using technology (see Table 1). The data shown in Table 1 was collected as part of a previous study regarding teachers' preconceptions about the implementation of devices in English classes. Due to the difference in their teaching and technology experience, and the lack of standardized training, I expected that the manner in which they used the devices would also be different.

**Table 1**  
*Participants' Teaching and Technology Experience*

Teacher Information	Sena	Miku
Teaching experience	3 years	30 years
Attitude towards devices	Positive	Negative
Technology training	3 hours	None
Prior use of technology	Frequent	Rare

The semi-structured interview format was chosen because I wanted the participants to discuss their general perceptions of the usefulness and ease of use of the devices while giving them the opportunity to discuss how and why they had used specific applications in greater depth. Semi-structured interviews also allowed the interviewees to extrapolate on uses of the devices outside of English lessons and to discuss how other teachers at their school had utilized them. Some of the questions were modified from those used by Davis (1989) in the technology acceptance model (TAM) which is regarded as being a reliable indicator of teachers' inclination to incorporate technology (Liu et al., 2017). The interviews were conducted in English, the L2 of the participants, but they were given the option to respond in Japanese.



Three interviews of between 30–45 minutes were conducted with each teacher: the first in December 2021, the second in March 2022, and the third in July 2022. The interviews were held in person and over Zoom depending on which was more convenient for the participants. The participants gave their informed consent and were made aware that they could withdraw from the study at any point.

The interviews were recorded, transcribed, and then analyzed using QDA Miner Lite (Provalis Research, 2016). The text was coded in reference to the themes of teacher training, support systems, and attitudes towards technology to address whether the participants perceived them to be key factors in their use of the devices. The text was also coded for themes that were shared between the two participants. Through the coding process, some connected themes emerged: learner and teacher-centered approaches, the influence of the Japanese education system, and proficiency-related motivation.

## Results

The interviews were examined to discover how the devices affected the teaching practices of the participants. Two main categories were identified as impacting the teachers' pedagogy: anticipated issues and emerging issues. Anticipated issues included matters which could be expected considering the accelerated launch of the GIGA Schools Program: a lack of teacher training, underdeveloped support systems, and negative teacher attitudes towards technology. Emerging issues were topics not directly a result of the lack of preparation time: learner- and teacher-centered approaches, the influence of the Japanese education system, and proficiency-related motivation.

### Anticipated Issues

#### *The Impact of a Lack of Teacher Training*

Over the course of the year neither teacher attended formal training sessions and neither teacher established rules regarding the usage of the devices from the outset. Instead, they relied on the rules their schools had set, such as policies about taking home the devices, website blockers prescribed by the local board of education, and traditional classroom management techniques.

Sena's students often used the computers in a synchronous manner, whether taking part in quizzes or viewing the same slides, and so it was relatively simple for her to observe whether the students were on task or not. When the students used creative applications such as Jamboard, an interactive whiteboard which groups of students can

collaborate on simultaneously, Sena was able to monitor each group's Jamboard from her own computer.

Miku's students, on the other hand, primarily used the devices asynchronously to work on individual tasks such as creating solo presentations, using translation software, and reviewing the contents of the lesson. It was challenging for Miku to determine whether all her students were on task or not because she had no way to monitor the screens without walking around the classroom. Miku noted that when using the devices, the class would occasionally become unruly. Some of her students complained that other class members were using the devices for purposes unrelated to the lesson.

Miku was also concerned by the extent to which her students utilized translation software. Although she had introduced it as a support mechanism, many students used it preemptively without attempting to process the input themselves. Miku suggested that both the discipline issues and the pedagogical misuse of the tools were a byproduct of the lack of preparation time the teachers were given. She noted that the teachers were so focused on learning how to use the devices, they did not consider how they should integrate them, and what their purpose was for doing so.

### *Developing Support Systems*

In the first semester, the teachers reported both technical issues and user issues occurring in every class. Technical issues mentioned included faulty equipment and internet connectivity problems: each school year was only able to access the internet on one designated weekday, and the Wi-Fi would frequently stop working. User issues included students not understanding how to log in, forgetting passwords, and not using the correct settings. By the second semester of using the devices, a GIGA School Supporter, a technical support staff member, was employed at each school. Their role was primarily to provide technical assistance with the use of software and when equipment malfunctioned. Many of the user issues were later solved through increased familiarity with the devices and applications.

There was no support in terms of pedagogical advice regarding the use of the devices. The teachers learned how to operate the devices and which applications to use through their own research, in their own time. Both teachers reported that few other teachers at their workplace used the devices in lessons, and that they were the only English teachers in their school using them. Miku spoke of wanting to watch how other English teachers used the devices in their classes to learn other ways they could be used.



### *Attitudes Towards Technology*

Over the academic year, the degree to which Sena utilized the devices fluctuated with her perception of their usefulness. Initially Sena used them once a week to check her students' comprehension of reading passages and to conduct simple grammar tests through multiple-choice question quizzes on Google Forms. As she discovered other educational applications which augmented her usual teaching practices, she utilized the devices to a greater extent. By the end of the second semester with the devices, Sena's students were using them in three out of four of her weekly English lessons.

Miku's attitude shifted from not wanting to utilize the devices at all, to making them a core facet of her lessons. Rather than avoiding the devices she embraced her previous insecurities, seeing the situation as a collective learning opportunity for both her and her students.

### *Emerging Issues*

#### *Learner and Teacher-Centered Approaches*

Despite having the same tools to work with, the participants took different approaches as to how they utilized the devices. Sena primarily used the technology to enhance her pre-existing pedagogical style; the devices served as a digital substitute for paper-based methodology. She made extensive use of Nearpod, a gamified learner management system (LMS), to show grammatical explanations on slides before checking comprehension through games which the students took part in simultaneously. Sena was able to dictate the pace of the lesson and retain control through the LMS while utilizing the affordances of the devices to allow her students to view and interact with the information. The students were also able to receive feedback instantaneously on an individual basis. Using the technology, she addressed a number of issues her students had faced, such as difficulty in seeing the class TV screen, having to wait for test results, and being able to answer a teacher's question without the risk of losing face in front of peers.

Miku adopted a more free-form approach as to how her students used the devices; the computer was seen as a tool to facilitate learner autonomy. Through Google Drive, she made her slides available for students to review by themselves. She assigned reading materials which contained vocabulary not covered in the textbook, recommending her students to use the devices to look up words they did not understand. The students were also encouraged to make use of the devices when writing answers to composition questions, because it would enable them to express their opinions in more detail. In addition, the students could use the devices to check the coherence and grammatical

accuracy of their output. Whereas Sena's school did not allow the students to take the devices home, the students in Miku's school were required to do so daily. As such, Miku's students were able to review material and make use of the affordances of the devices independently in a way that Sena's students were not.

#### *The Influence of the Japanese Education System*

Although in the previous semester Sena had used the devices in the majority of her lessons, when her students moved up to Year 9, she did not use the devices a single time. This was due to two main factors: the arrival of a new teacher in her school, and the impending high school entrance examinations.

In the previous academic year, Sena had taught all five of the Year 8 classes. However, from the start of the next academic year, Sena shared the Year 9 classes with the incoming teacher. The newly arrived teacher had a great deal of experience, and was Sena's senior in terms of age, but she had not been teaching for several years. The new teacher was unfamiliar with the devices and so, in order to standardize the lessons across the classes, Sena decided not to use the devices.

The second reason was the need to prepare her students for the high school entrance examinations. Sena mentioned several times how she was concerned that her students were not able to get sufficient writing practice due to an increase in the use of the devices.

Miku expressed similar concerns that the use of the devices would be a detriment to preparation for the high school entrance examinations. Although her students continued to use the devices at home, she reduced the amount of time she spent using them in the classroom in favor of a pen and paper approach.

#### *Proficiency-Related Motivation*

Both teachers reported that using the devices was highly motivating for the students, most notably in the case of lower proficiency and typically less engaged students. According to Sena, "Students get very motivated by using the devices. Even those who don't like English think, ok, I'll try it." Miku echoed the sentiment, suggesting that students who did not like to study English were more motivated because they could interact with the devices.

Although the increase in classroom engagement was welcomed, Miku was concerned that when the material was too difficult, student interaction with the devices was less



meaningful. She observed that when students felt that their knowledge of the language was too significant a barrier to overcome, they would choose answers randomly, ignore the materials, or engage in off-task activities. On the other hand, Sena was worried that more proficient students saw the devices as entertainment without any educational merit, “I feel the high-level students think that Chromebooks are not that useful because they’re just playing games and they don’t learn anything from it.”

Sena also suggested that some students became demotivated by the frequent use of the devices. Several mentioned to her a gap in computer literacy where they felt disadvantaged in terms of the contributions, they were able to make because they lacked the ability to type their responses quickly. Sena explained that many students struggled to type in Japanese, let alone English, and needed to be taught how to use basic keyboard functions such as the shift key.

### Discussion

The interviews give two teachers’ perspectives into the challenges and affordances provided by the devices in their first year of using them. Using these insights, I will discuss key findings and make suggestions as to how educational authorities can help to prepare their teachers, and how teachers can improve their use of the devices.

### Ongoing Pedagogical Training

Teachers will have to consider carefully how they introduce the devices so that students are aware of their responsibilities when they use them. As was reflected in Miku’s case, Blikstad-Balas and Davies (2017) found that when devices are distributed without guidelines, students are likely to use them in an off-task manner. In fact, it is often students rather than teachers who want restrictions on devices out of concern they may be a distraction (Clarke et al., 2013). Although public Japanese schools often rely on traditional methods of maintaining discipline, educators may be forced to adopt a more constructivist approach to classroom management in order to utilize the learner-centered approach facilitated by devices (Liu et al., 2017).

If teachers do not receive technology training specific to their subject it reduces their perception of its usefulness (Koehler & Mishra, 2009). Training is less of an issue, however, if teachers have the opportunity to learn through self-discovery (Saltmarsh, 2021). However, this is time-intensive and requires trial and error in classroom situations. Zhao and Bryant (2006) suggested holding mentoring sessions that take place within actual lessons to ensure that support was readily available when it was needed

the most. Without the support of knowledgeable peers, teachers may be unaware of which applications are from trusted sources, whether they are free or paid, and if they effectively facilitate learning. Teachers need to have access to an online network of peers to exchange information about how to best utilize the devices to teach their subject. In this study both teachers noted that they were the only English teachers in their respective schools using the devices.

### Fostering Positive Attitudes of Teachers and Students

Prior to the launch of the GIGA School Program, the two teachers had different responses to the prospect of using the devices. Sena was enthusiastic at the possibilities and wanted to use the devices at least once a week, whereas Miku was reticent, suggesting she would use the devices once a semester at most. This generational gap in attitudes reflected the findings of Li et al. (2019) that teachers under the age of 45 tended to use technology more than those over 45. In addition, Baek et al. (2008) found that less-experienced teachers chose to use technology of their own volition while more experienced teachers did so in response to perceived pressure from external forces. However, as Teo et al. (2009) noted, teachers’ perceptions of usefulness and ease of use regarding technology do not remain static. As an example, Miku used her lack of knowledge about the devices as a shared learning experience for her and her class. Miku’s change in attitude suggests that even teachers who are skeptical about the devices could benefit from implementing them if they engage their students as peers in the implementation process.

The majority of students responded positively to the devices across both schools. Sena and Miku commented on two beneficial aspects of the screen-based interaction for low-proficiency students: the low investment nature of the interaction, and the ability to volunteer a response without the risk of losing face. Using the touch screen to choose a multiple-choice answer requires far less effort than writing a response, and for many students raising their hands to answer a question has the potential for little reward but significant embarrassment.

### Exams Need to Reflect the Learning Process

In Japan, high-stakes entrance examinations have proven to be a reason for teachers to abandon pedagogical innovation in order to teach to the test (Kikuchi & Browne, 2009). The notion of transfer-appropriate processing (Lightbown, 2008) is that learning which takes place under similar conditions to how it is tested is more likely to be recalled in the



test. Because the manner in which students interacted with the devices was so different to how they would take the tests, it is understandable that teachers who focused on helping their students to prepare for those tests would choose not to use the devices as the examinations drew near. Blikstad-Balas and Davies (2017) found that such concerns were not limited to teachers, with some students so worried that the use of devices was not conducive to the learning process that they would handwrite the notes taken on their devices. Gorsuch's (2001) study revealed that teachers in Japan were greatly influenced by the need to prepare students for entrance examinations, with perceived pressure coming from their superiors, the parents of the students, and from the students themselves. Teachers must be able to convince the relevant stakeholders that the devices can facilitate the type of learning, which is transferrable for these high-stakes tests, otherwise this inclination to abandon technology at critical moments could lead to the impression that computer-mediated learning is less worthwhile than traditional methods. In the future, consideration should be given to changing the format of examinations to include sections which require typing in English. This will ensure that the use of the devices becomes a fundamental part of the learning process, and a focus on typing rather than writing reflects how students are likely to use English going forward.

### Conclusion

In response to the purpose of the study, the devices initially changed the teaching practices of the participants in a number of ways. Over the course of the year, how the participants used the devices and the extent to which they did so changed as they gained a greater understanding of the affordances of the technology. Sena discovered applications which could augment her teacher-centered approach whereas Miku shifted to a more student-centered approach by allowing her students to use the devices autonomously. However, by the third semester both teachers displayed misgivings about the capability of the devices to fulfil their primary goal: to prepare their students for the high school entrance examinations. Although they grew in confidence in their ability to integrate the technology in their lessons, the teachers' opinion of the usefulness of the devices decreased as their goals for their students shifted. While the ease of use of the devices will lead to teachers having a more favorable opinion of them, ultimately it is their perceptions regarding the usefulness of the devices which determine whether or not they utilize the technology (Davis, 1989). By the time the students had entered their final year of junior high school, Sena had stopped using the devices, and Miku's students primarily used them to review materials at home. For devices to become integral to English education in Japan, teachers will need ongoing pedagogical training. In addition,

the examination system will need to be changed to reflect the fact that every student now has access to their own computer. If teachers are given a simple and convenient way to share their experiences with the devices, and if they can access a collective resource of knowledge, it will help them integrate the devices efficiently and effectively into their pedagogy.

### Bio Data

Steven Lim is currently an assistant professor at Meikai University and has been teaching at various positions in Japan since 2005. His research interests include teacher beliefs and practices, motivation, speech modification, CALL, and multilingualism.

### References

- Baek, Y., Jung, J., & Kim, B. (2008). What makes teachers use technology in the classroom? Exploring the factors affecting facilitation of technology with a Korean sample. *Computers & Education*, 50(1), 224–234. <http://dx.doi.org/10.1016/j.compedu.2006.05.002>
- Blikstad-Balas, M., & Davies, C. (2017). Assessing the educational value of one-to-one devices: Have we been asking the right questions? *Oxford Review of Education*, 43(3), 311–331. <https://doi.org/10.1080/03054985.2017.1305045>
- Clarke, B., Svanaes, S., & Zimmermann, S. (2013). One-to-one tablets in secondary schools: An evaluation study. *Tablets for schools*. <https://www.kidsandyouth.com/pdf/FK%26Y%20T4S%20Stage%203%20Tablets%20for%20Schools%20Report.pdf>
- Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13(3), 319–340. <https://doi.org/10.2307/249008>
- Duhaney, D. C. (2001). Teacher education: Preparing teachers to integrate technology. *International Journal of Instructional Media*, 28(1), 23–30. <https://www.proquest.com/docview/204263455?pq-origsite=gscholar&fromopenview=true>
- Gorsuch, G. J. (2001). Japanese EFL teachers' perceptions of communicative, audiolingual and yakudoku activities: The plan versus the reality. *Education Policy Analysis Archives*, 9(10), 1–27. <https://doi.org/10.14507/epaa.v9n10.2001>
- Kikuchi, K., & Browne, C. (2009). English educational policy for high schools in Japan: Ideals vs. reality. *RELC Journal*, 40(2), 172–191. <https://doi.org/10.1177%2F0033688209105865>
- Koehler, M., & Mishra, P. (2009). What is technological pedagogical content knowledge (TPACK)? *Contemporary Issues in Technology and Teacher Education*, 9(1), 60–70. <https://www.learnlib.org/primary/p/29544/>



- Li, Y., Garza, V., Keicher, A., & Popov, V. (2019). Predicting high school teacher use of technology: Pedagogical beliefs, technological beliefs and attitudes, and teacher training. *Technology, Knowledge and Learning*, 24(3), 501–518. <https://doi.org/10.1007/s10758-018-9355-2>
- Lightbown, P. M. (2008). Transfer appropriate processing as a model for classroom second language acquisition. In Z. Han (Ed.), *Understanding second language process* (pp. 27–44). Clevedon, UK: Multilingual Matters.
- Liu, H., Lin, C. H., & Zhang, D. (2017). Pedagogical beliefs and attitudes toward information and communication technology: A survey of teachers of English as a foreign language in China. *Computer Assisted Language Learning*, 30(8), 745–765. <https://doi.org/10.1080/09588221.2017.1347572>
- Provalis Research. (2016). QDA Miner Lite (Version 2.0.8) [Computer software].
- Saltmarsh, J. (2021). *1:1 Chromebooks in high school classroom: Teacher perceptions of integration efforts*. [Doctoral dissertation, University of New England]. All Theses and Dissertations 349. <https://dune.une.edu/theses/349>
- Scherer, R., Siddiq, F., & Tondeur, J. (2019). The technology acceptance model (TAM): A meta-analytic structural equation modeling approach to explaining teachers' adoption of digital technology in education. *Computers & Education*, 128, 13-35. <https://doi.org/10.1016/j.compedu.2018.09.009>
- Teo, T., Lee, C. B., Chai, C. S., & Wong, S. L. (2009). Assessing the intention to use technology among pre-service teachers in Singapore and Malaysia: A multigroup invariance analysis of the Technology Acceptance Model (TAM). *Computers & Education*, 53(3), 1000–1009. <https://doi.org/10.1016/j.compedu.2009.05.017>
- Zhao, Y., & Bryant, F. L. (2006). Can teacher technology integration training alone lead to high levels of technology integration? A qualitative look at teachers' technology integration after state mandated technology training. *Electronic Journal for the Integration of Technology in Education*, 5(1), 53–62. <https://stu.westga.edu/~bthibau1/MEDT%208480-Baylen/Zhaosample.pdf>