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# Technological literacy and language learning: Undergraduate attitudes

**Barrie Matte**

Osaka Jogakuin University  
[matte@wilmina.ac.jp](mailto:matte@wilmina.ac.jp)

**Aeric Wong**

Osaka Jogakuin University  
[wong@wilmina.ac.jp](mailto:wong@wilmina.ac.jp)

**Hiroyo Nakagawa**

Osaka Jogakuin University  
[nakagawa@wilmina.ac.jp](mailto:nakagawa@wilmina.ac.jp)

**Kaori Hakone**

Osaka Jogakuin University  
[hakone@wilmina.ac.jp](mailto:hakone@wilmina.ac.jp)

**Philip Head**

Osaka Jogakuin University  
[head@wilmina.ac.jp](mailto:head@wilmina.ac.jp)

**Tamara Swenson**

Osaka Jogakuin University  
[dr.tamara.swenson@gmail.com](mailto:dr.tamara.swenson@gmail.com)

**Aaron C. Sponseller**

Osaka Jogakuin University  
[sponseller@wilmina.ac.jp](mailto:sponseller@wilmina.ac.jp)

This study discusses the results of a longitudinal technological literacy survey of undergraduate English majors ( $n = 285$ ) conducted in 2022 ( $n = 176$ ) and 2023 ( $n = 109$ ) at a small private women's university in Western Japan. The survey asked participants about their technology use pre-entry, changes in their technology use since entry, preferences regarding the various devices available for accessing applications commonly used in language classes, and issues they had with devices (smartphones, tablets, and computers) used to complete a range of language-related assignments. The results showed that the abilities of students matched the abilities required for using the technology in their classes. The findings indicate that a baseline of technological literacy should not be assumed for all students, that students will choose and adapt to technology in a way that suits their needs, and that it is difficult to predict the utility and longevity of emerging technologies.

**Keywords:** technological literacy, language learning, mixed-methods research

## Introduction

The use of technology both inside and outside the classroom provides access to educational resources that may otherwise be inaccessible to students. Technology is a valuable resource for language learning, so being aware of learners' proficiency for using that technology can assist in preparation of language programs (Butler, 2022; Swenson et al., 2023; Wang, 2021). To operationalize technological literacy, we adopt the definition of Gilster (1997): "the ability to understand and use information in multiple formats from a wide range of sources when it is presented via computers" (p. 1).

Since 1991, our institution has been using technology as a primary learning tool. iPads were introduced in 2012 to replace many of the paper-based texts that were previously used, predominantly using in-house texts via iBooks (Swenson et al., 2023). In recent years, however, the iBook software has become obsolete, and we have begun to use other digital media in its place (such as Google Docs). The students at our school are asked to use an iPad for many of their classes, though many students use their smartphones and personal computers in addition for completing their assignments.

Due in part to the changing climate of technology in education, our study was conducted to gain insights into our students' technological literacy before and after matriculation. Integration of information and communication technology in classrooms is indispensable (Hofmeyr, 2023; Lim, 2023; Salaberry, 2001; Waluyo, 2020). The main objective of this study was to develop a better understanding of the background our students enter with, as more and more of our programs incorporate the use of digital media and require interaction through online learning management systems.

## Method

### *Participants*

In this study, participants from both our junior college and university programs were surveyed over the course of two years. In total, 145 participants completed the survey in the first year (2022), and 109 participants completed the survey in the second year (2023).

### *Instrument*

A 30-question survey was administered online as a Google Form, which focused on the use of technology and students' self-reported technological literacy, as well as the various ways in which they use the technology that they have available to them, and their preferences for which technology they use for school assignments. The survey was divided into two sections, the first to assess experience with different devices before and after entry to the college and university, and the second section for self-reporting confidence in completing specific tasks using iPads, smartphones, and computers. To measure the construct of confidence, a four-point Likert scale ranging from "Yes, I can" to "No, I cannot" was employed. Participants in the study

were offered an Amazon gift card as a reward for completing the survey, and any students at the school were eligible to participate.

Results

The results of the survey have been organized in a succinct visualization of the responses. The data have been organized into four sets of figures: Pre- and post-matriculation use of technology, and changes in confidence in the use of iPads, smartphones, and computers for educational purposes.

The responses from Questions 1 through 6 of the survey can be seen in Figures 1 and 2. Questions 1 to 3 asked about how often the respondents had used iPads, smartphones, and computers for schoolwork prior to entering the university. Questions 4 to 6 asked about their current use of the same devices for schoolwork at the time of answering the survey.

Figures 1 and 2 show a comparison of students' use of iPads, smartphones, and computers, before and after matriculation, across Time 1 (T1, 2022) and Time 2 (T2, 2023). In Figure 1, the respondents overwhelmingly indicated that prior to matriculation, they did not use iPads or smartphones for schoolwork, with reports of using both devices inverting post-matriculation. The opposite can be seen with computer use, where the use of computers decreased dramatically.

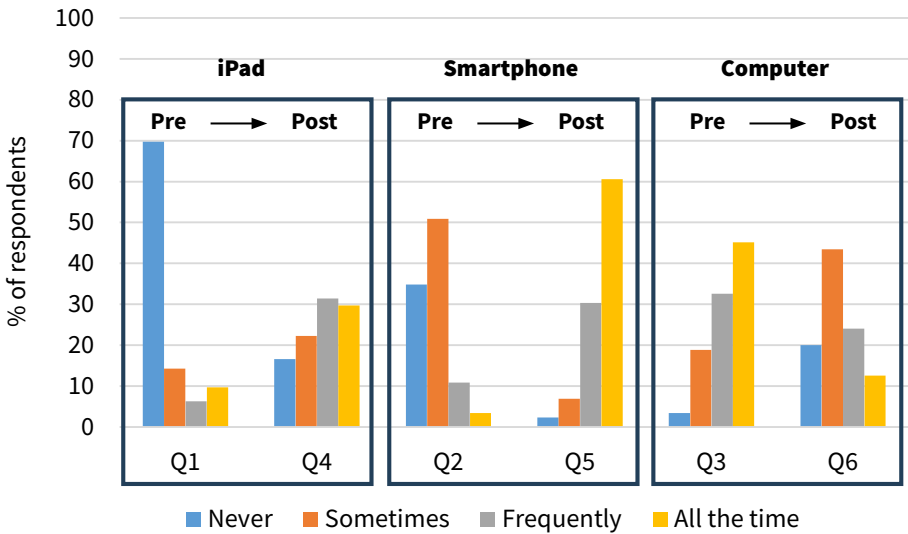
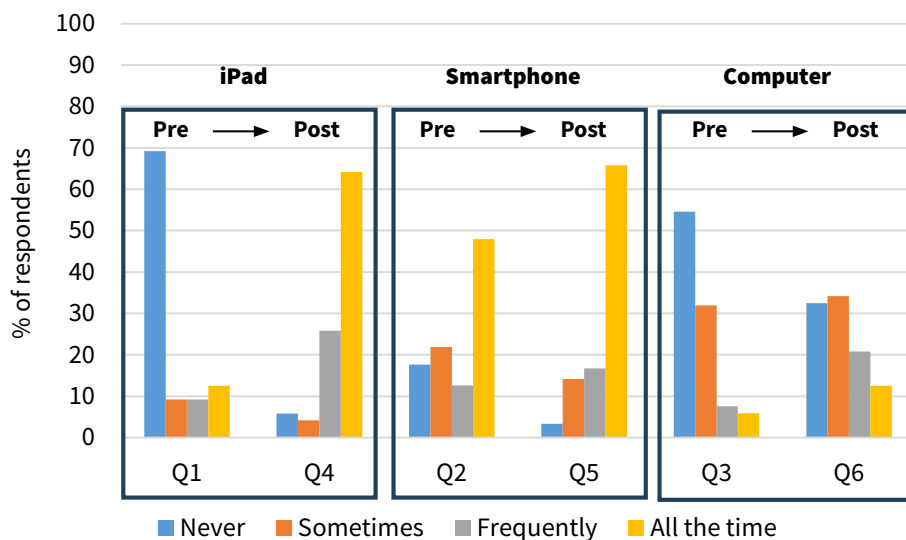


Figure 1. Comparison of technology use before and after matriculation at time 1.

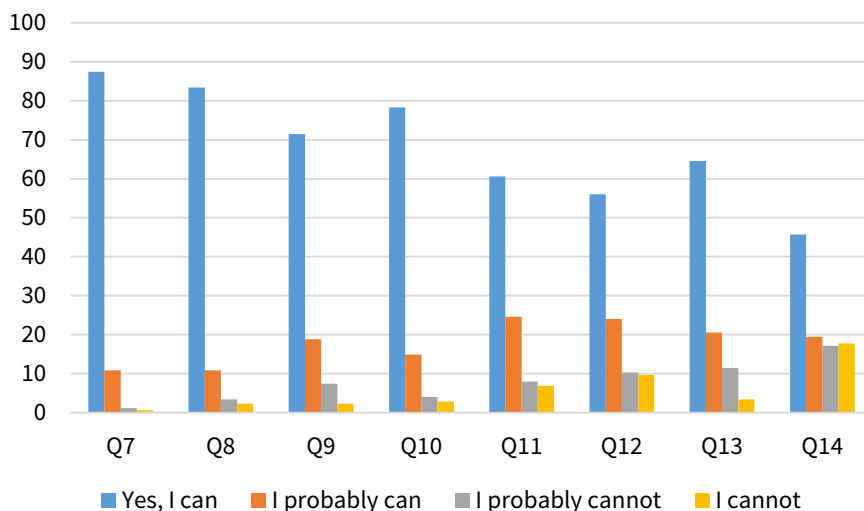
Figure 2 shows the results for T2, collected in 2023, indicating similar results for iPad usage; however, smartphone and computer usage increased. As previously noted, the COVID-19 pandemic would have had some effect on access to devices. Overall, there were increases in the use of all three devices.



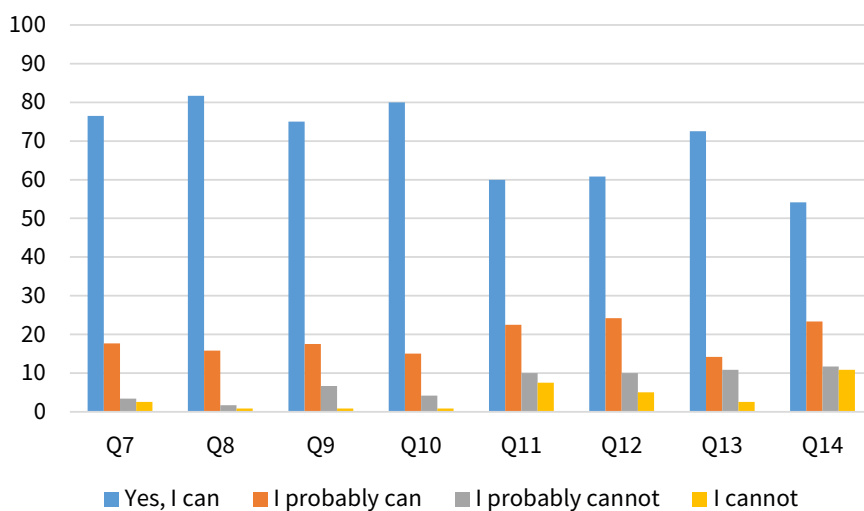
**Figure 2.** Comparison of technology use before and after matriculation at time 2.

Figures 3–8 refer to the following questions. Question 7 asked about confidence in uploading assignments. Question 8 asked about copying documents. Question 9 asked about editing documents. Question 10 asked about creating documents. Question 11 asked about sharing a screen. Question 12 asked about editing videos. Question 13 asked about organizing files in a folder. Question 14 asked about hosting a meeting (via Zoom or Google Meet).

Figures 3 and 4 show the results of the eight survey questions for T1 and T2 with regards to using an iPad for each task. At both T1 and T2, participants reported strong confidence in using iPads for most tasks. Question 14 had the lowest reported confidence at both T1 and T2, most likely due to the students rarely being asked to host a meeting on their own devices. The observed confidence patterns demonstrate that students develop a better sense of their own competence through steady exposure to technology combined with classroom application. The continuous lack of confidence in hosting online meetings reveals deficiencies in the students' practical application of digital skills. The institutional implementation of technology supports fundamental technological skills yet demands targeted teaching methods for students to master less frequent or independent tasks.

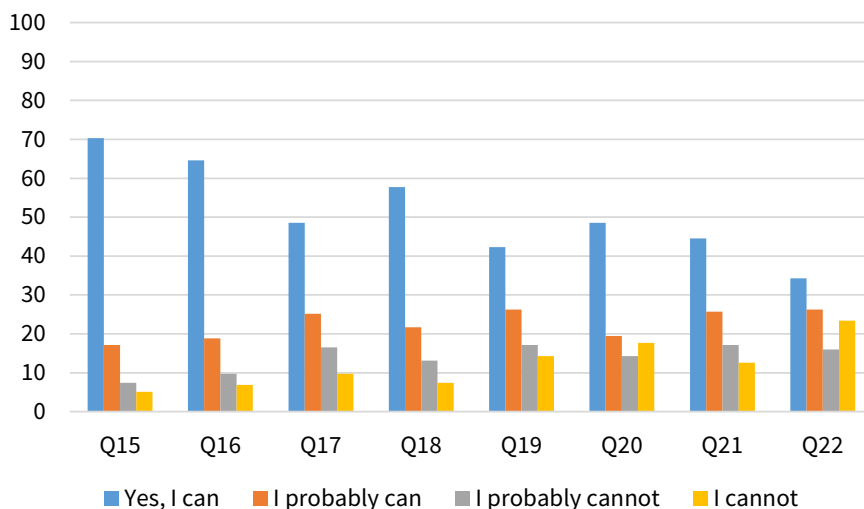


**Figure 3.** Self-reported iPad confidence at time 1.



**Figure 4.** Self-Reported iPad confidence at time 2.

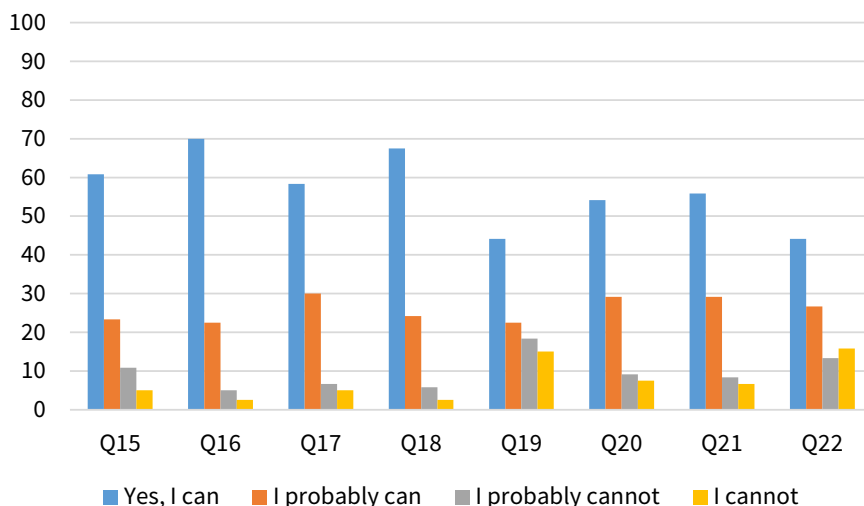
Figures 5 and 6 show the results for the eight survey questions over T1 and T2 regarding the use of smartphones for each task. The results parallel those for using iPads for the same tasks, with some differences that are likely due to iPads being the standard device used in class, and therefore the respondents had less familiarity with using smartphones for certain tasks (such as in Question 14 about hosting a meeting via Zoom or Google Meet).



**Figure 5.** Self-reported smartphone confidence at time 1.

Figure 6 shows that at T2, students had greater confidence in using smartphones to complete most tasks, such as in Questions 16, 17, 18, 20, and 21. The amount of time on task with devices for educational purposes during the COVID-19 pandemic was likely a cause for some of the differences between T1 and T2, as the devices used by students while studying off campus would have been the devices that they had greatest access to, such as a smartphone. Smartphones offer not only internet connection but applications, websites, and a familiar interface for text input.

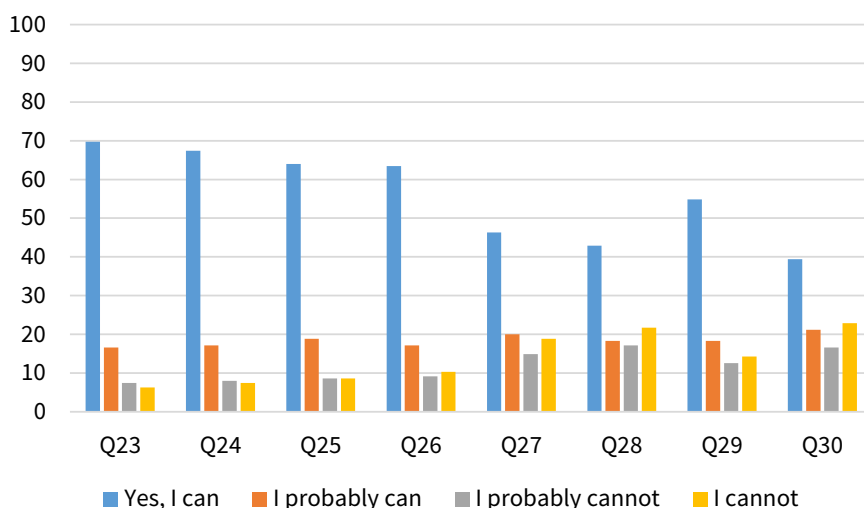
These results highlight a critical aspect of digital literacy development. Students develop confidence through both structured educational methods and their regular independent use of technology. Smartphones are not used as core teaching tools, yet their presence among students aids natural skill development. Effective integration of technology requires educators to recognize and expand students' informal learning practices, instead of ignoring them. Tasks that work on smartphones can improve accessibility and engagement for learners while also supporting equitable participation in technology-based language learning environments.



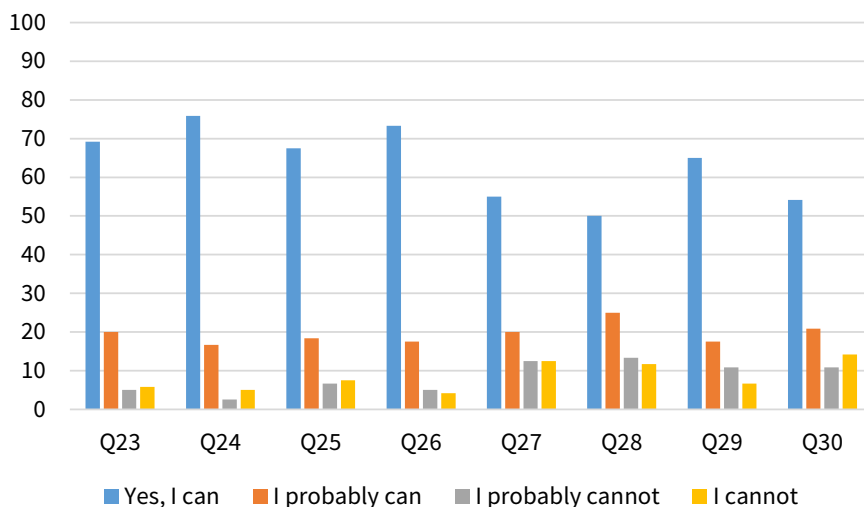
**Figure 6.** Self-reported smartphone confidence at time 2.

Finally, Figures 7 and 8 show the results of the eight survey questions over T1 and T2, with regards to using a computer for each task. Similar to the results for iPads and smartphones, reported confidence differed between T1 and T2 for reasons such as time spent with devices before and after entry to our school, and the requirements for specific devices to be used in certain classes.

Students reported some improvement in computer-related confidence but not as strongly as they did with other devices. Passive computer use restricted to class tasks fails to develop digital competence effectively. Computers remain irrelevant in student instruction unless educators actively scaffold their use, unlike iPads, which form part of daily teaching, and smartphones, which students use intuitively. Instructional design should advance computer literacy by promoting meaningful engagement with academic computer-based tasks beyond just accessing this technology.



**Figure 7.** Self-reported computer confidence at time 1.



**Figure 8.** Self-reported computer confidence at time 2.

## Discussion

The results of the survey suggest that experience with devices for educational purposes does not necessarily predict confidence in completing tasks using the same devices. For example, most students had very limited experience using iPads for education prior to entering our school, yet most students reported that they either could or probably could complete all of the tasks using the iPad that they were asked about in the survey. Similar responses were seen for both smartphones and computers, which increased in the frequency of and confidence in using the devices to complete tasks.

While there were no drastic changes across the survey results from T1 to T2, they show a trend of increasing confidence in all tasks. This suggests that regardless of which device students are using, they are going to choose the device that best enables them to complete tasks. As an educator, we often implore students to use computers and non-digital means for completing tasks; however, if students have the means to complete tasks faster or via a simpler means, they will certainly choose that instead. In order to control this, it is thus necessary to give clear instructions as to what the final product of a task should be.

## Conclusion

The goal of this study was to provide insight into the knowledge and abilities of students regarding the use of technology for education before and after entering college or university programs. What we found was that the baseline knowledge of technology should not be assumed, although not having any experience at all with a device does not seem to affect whether a student will be confident in using it compared with other devices that they have had experience with. Students will use whatever means are available to them to complete tasks, at times going against what their teachers

expect of them, such as using smartphones to complete tasks that we assume they are completing on their iPads or on computers.

Future studies should consider how the climate of technology use has changed after the COVID-19 pandemic, as the expectation of students having experience with and access to technology outside of school increased, which may have resulted in a generation with greater digital literacy than in the past. Another point of interest for future studies would be to survey students' preferences for devices, which is beyond the scope of this study but would provide insight for school administrators and program coordinators making decisions about how to design programs that rely on digital devices.

## References

- Butler, Y. G. (2022). Language education in the era of digital technology. *JALT Journal*, 44(1), 137–152. <https://doi.org/10.37546/JALTJJ44.1-7>
- Gilster, P. (1997). *Digital literacy*. Wiley.
- Hofmeyr, M. (2023). Attitudes towards digital game-based language learning among Japanese university students. *The JALT CALL Journal*, 19(1), 26–52. <https://doi.org/10.29140/jaltcall.v19n1.681>
- Lim, S. (2023). Are Japanese junior high school teachers ready for one-to-one devices in schools? A case study. *Language Teacher*, 47(1), 3–9. <https://doi.org/10.37546/JALTTLT47.1-1>
- Salaberry, M. R. (2001). The use of technology for second language learning and teaching: A retrospective. *The Modern Language Journal*, 85(1), 39–56. <https://doi.org/10.1111/0026-7902.00096>
- Swenson, T., Bramley, D., & Cornwell, S. (2014). Making interactive eBooks: More than just cutting and pasting. *Osaka Jogakuin College Bulletin*, 30, 17–30. [http://ir-lib.wilmina.ac.jp/dspace/bitstream/10775/3127/1/B\\_02Swenson.pdf](http://ir-lib.wilmina.ac.jp/dspace/bitstream/10775/3127/1/B_02Swenson.pdf)
- Swenson, T., Head, P., Wong, A., Matte, B., Nakagawa, H., Hakone, K., & Sponseller, A. C. (2023). Students' perspectives on iBooks, workbooks, and technology at OJU/OJC. <http://ir-lib.wilmina.ac.jp/dspace/bitstream/10775/3801/1/08U05swenson.pdf>
- Waluyo, B. (2020). Learning outcomes of a general English course implementing multiple e-learning technologies and active learning concepts. *Journal of Asia TEFL*, 17(1), 160–181. <http://dx.doi.org/10.18823/asiatefl.2020.17.1.10.160>
- Wang, Y. (2021). In-service teachers' perceptions of technology integration and practices in a Japanese university context. *JALT CALL Journal*, 17(1), 45–71. <https://doi.org/10.29140/jaltcall>