



Designing a Course to Support English Teacher Training for GIGA Schools

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Abstract

The GIGA School Program, initiated by Japan's Ministry of Education in 2019 [MEXT, 2019a, 2019b], aims to revolutionise education by integrating ICT in all schools. Its key objectives include equipping every student with a computer with a stable and high-speed Internet connection in schools, enhancing digital educational content to facilitate personalised learning, and improving teachers' ICT skills through training and support. This initiative seeks to create a technologically advanced and supportive learning environment, compelling the development of courses within the English teacher training program to equip future educators for these growing demands. Teacher training courses, thus, require practical components for technology use in the classroom that mirror real-world teaching scenarios. This study explores teacher-trainees' reflections on how well these courses prepare them to integrate technology for teaching English with ICT for their teaching rounds and beyond. The course incorporates practical elements, underscoring mastery in handling various computer devices and creating digital teaching materials. It combines theory and practice with tasks, such as utilising Learning Management Systems (LMS) in lesson plans, understanding Computer Adaptive Testing (CAT), designing tasks with mobile apps, and conducting language instruction activities through a web-conferencing system. Throughout the course, the students were exposed to various tasks designed to teach them different technologies and offer them first-hand experience of technology-enhanced learning. This study evaluates the data collected and analysed from two courses spanning eight semesters conducted during the academic years 2020-2023. The data includes classroom observations and end-of-semester surveys. Preliminary findings indicate that teacher-trainees believe they acquired the necessary knowledge and skills to appropriately integrate educational technology into their English teaching practices in school settings. This study concludes with implications for developing future-proof language teacher-trainee courses with technology.

Keywords: *Teacher training, foreign language education, ICT, course design*

1. Introduction

The teacher training program in Japan is currently undergoing a transition driven by the GIGA (Global and Innovation Gateway for All) school program, initiated by Japan's Ministry of Education in 2019 and launched in 2020 [1]. The program's primary objective is to revolutionise education by integrating information and communication technology (ICT) into all schools across Japan. It aims to provide every student with a personal computer, ensure a stable, high-speed internet connection, and enhance digital educational content to facilitate personalised learning. Additionally, it focuses on improving teachers' ICT skills through targeted training and ongoing support. These developments are designed to create a technologically advanced, supportive learning environment, which compels the need for teacher training courses to evolve accordingly.

In response to this shift, English teacher training courses now include practical components that mirror real-world teaching scenarios, especially in the effective use of technology in the classroom. The rapid acceleration of digital transformation in education, further spurred by the COVID-19 pandemic, has significantly impacted the implementation of these reforms. Teachers are now expected to be proficient in delivering both in-person and remote education using ICT, ensuring continuity and maintaining the quality of learning across various modes of instruction. This digital transformation has highlighted the urgent need for teachers to be equipped with advanced technological skills and, in turn, has directly influenced Japan's policy reforms in teacher training.

To address the growing demand for digital literacy in education, the Japanese government has introduced several policy reforms aimed at enhancing the ICT capabilities of educators. This is part of



a broader effort to modernise the country's education system, making it more resilient and adaptable to future challenges. Consequently, teacher training colleges, faculties, and graduate schools of teacher education are also undergoing transformations. While educators are constantly required to improve their competencies in response to societal changes and technological advancements, these institutions must also strive to upgrade and strengthen their teacher development and training programs [2].

One of the key outcomes of these reforms is the development of a new compulsory subject at the university level: "Theory and Method of Education Utilizing ICT." This course, introduced for the 2022 intake, includes practical elements such as the effective use of various devices, the creation of digital teaching materials, and the facilitation of distance education. These reforms have also influenced the English language teacher training curriculum. In 2020, in addition to the established English teacher training courses, new electives, "Current Topics in English Teaching: Technology and Language Learning A (Sem1)" and "Current Topics in English Teaching: Technology and Language Learning B (Sem2)" were introduced at a mid-sized university in Tokyo. These courses were designed to align with the MEXT (Ministry of Education, Culture, Sports, Science, and Technology) policy and equip future educators with the skills necessary to meet the demands of modern classrooms. One of the authors has managed and taught these courses since it was first established.

This study explores teacher trainees' reflections on how effectively these courses prepared them to integrate ICT into their teaching practices, particularly in the context of English language instruction. Data were collected and analysed from two courses spanning eight semesters, conducted between 2020 and 2023. The sources of data include classroom observations and end-of-semester surveys. This case study, guided by design-based research principles, focuses on the perceptions of teacher trainees regarding how well these courses supported their preparation for integrating technology into English language teaching, especially in the context of GIGA Schools. The study follows Ma and Harmon's iterative design process [3] to create an effective learning environment for these students.

2. Course Design

The elective courses, *Current Topics in ELT: Technology and Language Learning (TLL) A* and *B*, are offered in the first and second semesters, respectively, to 3rd- and 4th-year undergraduate students pursuing an English teaching license for secondary education in Japan. Most students who complete TLL A, which is more practice-oriented, continue to TLL B in the following semester, which emphasises theoretical foundations. By their 4th year, students are preparing for the teacher employment selection examination, and these courses aim to equip them with essential ICT skills to complement their English teaching competencies. All classes are conducted in English, and students in these courses generally achieve an upper B1 level on the CEFR scale, as GTEC test results indicate [4]. This places them on track toward the national benchmarks, where 80.7% of high school and 44.8% of junior high school English teachers in Japan have achieved a B2 level or higher on the CEFR scale [5].

While language proficiency has been a central component of teacher training thus far, the increasing demand for digital literacy highlights the need for an ICT component to be integrated into future teacher training programs. To address this, the TLL courses are designed using the Technological Pedagogical Content Knowledge (TPACK) framework. Some researchers argue that TPACK promotes understanding and competency of technology in both pre- and in-service teachers [6] [7] [8] [9]. TPACK is a framework for integrating and effectively using educational technology, pedagogy, and content knowledge. The concept emphasises that for technology to be used effectively in education, it is necessary to deeply understand the content and how to teach it, not just knowledge of the technology. Figure 1 shows the basic concept of the TPACK [10] [11].

The TPACK framework consists of three key knowledge domains:

- **Technological Knowledge (TK):** Understanding and effectively using digital tools and technologies in education.
- **Pedagogical Knowledge (PK):** Understanding effective teaching methods and educational theories.
- **Content Knowledge (CK):** Mastery of the subject matter taught (in this case, English language teaching).

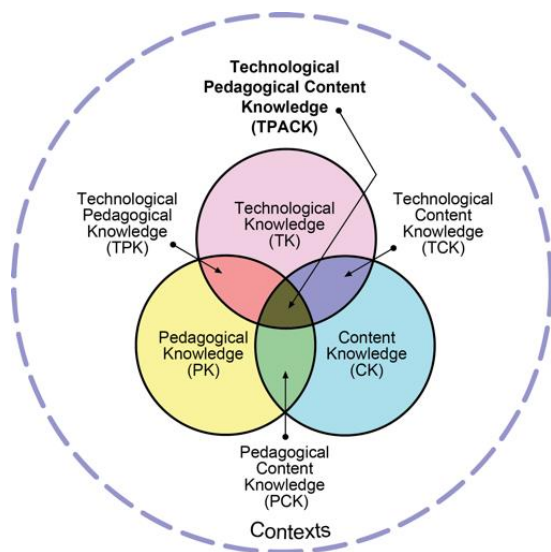


Fig. 1. TPACK.ORG

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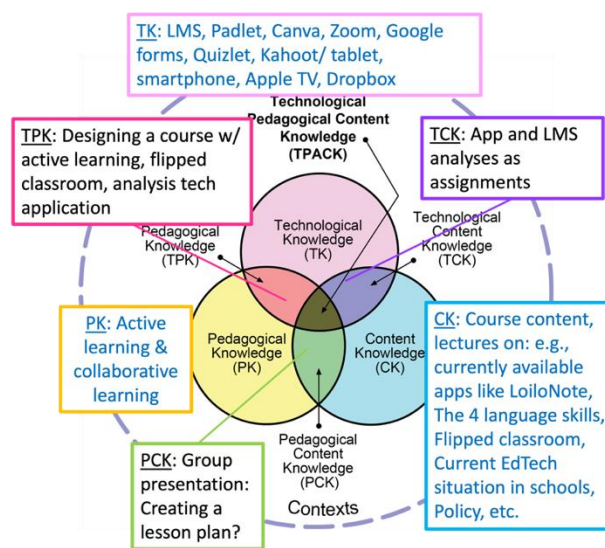


Fig. 2. TPACK course design

The overlap of these domains represents the optimal conditions for teaching content using technology. Figure 1 illustrates this basic concept of TPACK, while Figure 2 highlights the questions that guided the course design, ensuring that each knowledge domain was addressed in the classroom:

- **TK:** What digital tools are available for this class? Which are most suitable to use?
- **PK:** How do students learn best? What teaching strategies will be most effective?
- **CK:** What content will be taught, and how can technology enhance its delivery?

Additionally, the framework includes combinations such as:

- **TPK (Technological Pedagogical Knowledge):** Understanding how technology can support pedagogical strategies.
- **TCK (Technological Content Knowledge):** Using technology to enhance content delivery.
- **PCK (Pedagogical Content Knowledge):** Applying effective teaching strategies for specific content.

The course incorporates theory and practice, with hands-on tasks designed to enhance students' proficiency in using technology for teaching. These include mastering digital tools and creating teaching materials, utilising Learning Management Systems (LMS) in lesson plans, understanding Computer Adaptive Testing (CAT), designing in and out-of-class activities with mobile apps, and conducting language instruction through a web-conferencing system. Following the TPACK framework, the course integrates technology, pedagogy, and content knowledge, ensuring that students not only learn how to use digital tools but also understand when and why to implement them in their teaching practices.

The courses follow a structured approach, with students receiving hands-on training in the first semester and focusing on theoretical applications in the second. The practical elements include integrating technology across the four English skills: writing (e.g., Criterion, Grammarly), reading (e.g., xReading, Santa), listening (e.g., BBC Learning English, Duolingo), and speaking (e.g., ELSA, FantaSpeak).

Lectures also cover topics such as the current state of ICT use in education, the benefits and challenges of introducing ICT into schools, and the latest EdTech applications in Japan. Students design lesson plans incorporating active learning and EdTech tools, including flipped classroom models. Figure 3 provides an overview of the course content and topics covered annually.



3. Methods

3.1 Participants

This longitudinal study, conducted between 2020 and 2023, focused on TLL courses offered to third- and fourth-year undergraduate English teacher trainees. These courses were elective, and the study followed 27 students who enrolled in both courses consecutively over two semesters during the four-year study period (eight semesters). Although 76 students took one or both courses during this time, only the 27 who completed both courses were included in this research. Of these, 23 were third-year students, and four were in their fourth year. The number of participants by year is 1 (2020), 11 (2021), 7 (2022), and 8 (2023). Based on GTEC test results, the participants' English proficiency placed them at the upper B1 level according to the CEFR scale. These students were not particularly advanced in digital literacy, and many enrolled in the courses to overcome their anxiety about using technology in educational contexts. This apprehension reflects a broader trend in which teacher trainees feel underprepared to use digital tools in the classroom, underscoring the importance of such training.

3.2 Data Collection

Data were gathered using end-of-semester surveys to capture participants' reflections on course activities, their acquisition of EdTech knowledge, and improvements in both their teaching and English language skills. The surveys also explored their perspectives as future teachers, asking them to reflect on the role of technology in English classes, the types of technology they would like to use, and the English skills they believed could be enhanced through technology. These surveys were conducted online each year at the end of the second semester.

In addition to quantitative data on participants' general impressions, qualitative data were gathered from open-ended questions, which were later analysed using inductive coding. This mixed-methods approach provided a comprehensive view of the courses' tangible and perceived outcomes.

4. Results

Overall, the courses were well-received by participants, with quantitative responses indicating high levels of satisfaction with the knowledge and skills gained. As shown in Table 1:

Table 1. General impressions of the course

Q#	Questions	Strongly Agree	Agree
Q5	Did you gain new knowledge and/or perspectives about using ICT in education through the course?	92.6 %	7.4 %
Q7	Did the course help you learn English teaching methods using ICT?	96.3 %	3.7 %
Q8	Would you like to use the knowledge you learned in this course as an English teacher in the future?	92.6 %	7.4 %

None of the participants selected neutral or negative options, underscoring the overall positive reception of the courses. The open-ended questions provided additional insights into how participants perceived the role of ICT in education and its future applications. Responses to the four open-ended questions, analysed using inductive coding, revealed the following categories based on the number of entries and themes:

Table 2. Summary of Open-Ended Questions

Q#	Questions	Entries	Categories
Q12	What do you think about the role of technology in English classes?	44	8
Q13	Should technology be incorporated into English education? How do you think it would be best to incorporate it?	49	6
Q14	As a teacher, what technology would you like to use in your English classes and why?	46	6
Q15	Choose the English skills you think technology will be particularly useful for improving. (Multiple answers allowed)	57	5



Table 3. Q12 What do you think about the role of technology in English classes?

Category	Example reflections	Entry
Reducing Teacher Burden	<i>Digital tools can reduce the time teachers spend on grading and organizing.</i>	8
Enhancing Student Engagement	<i>Immediate access to information helps students overcome vocabulary challenges.</i>	7
Creating a Supportive Learning Environment	<i>Technology allows for personalized learning experiences.</i>	7
Enhancing Learning Experiences	<i>Technology can bridge gaps by connecting students with international peers.</i>	6
Facilitating Global Connections	<i>Students can engage in collaborative projects with peers globally.</i>	5
Supporting Basic Skill Development	<i>AI systems can analyse individual weaknesses and provide tailored tasks.</i>	5
Fostering a Global Perspective	<i>Exposure to diverse cultures through collaborative web conferencing enriches students' learning experiences.</i>	3
Encouraging Collaborative Learning	<i>Collaborative tools enhance communication and teamwork skills.</i>	3

Table 4. Q13 Should technology be incorporated into English education? How do you think it would be best to incorporate it?

Category	Example reflections	Entry
Encouraging Student Autonomy	<i>Provide opportunities for students to learn based on their interests.</i>	12
Promoting Active Learning with Technology	<i>Using technology promotes active learning. Introducing flipped classrooms is effective.</i>	8
Including Digital Tools	<i>Use apps such as ELSA to teach pronunciation.</i>	8
Recognizing the Future Importance of ICT	<i>We must understand the shortcomings of technology and integrate it appropriately.</i>	7
Reducing Teacher Workload	<i>Use technology to manage assignments and grades.</i>	7
Increasing Opportunities for Interaction	<i>Deepen learning through intercultural exchange.</i>	7

Table 5. Q14 As a teacher, what technology would you like to use in your English classes and why?

Category	Example reflections	Entry
LMS	<i>Simplify student information management.</i>	9
LoiloNote	<i>Homework management is easy, and opinions can be exchanged smoothly.</i>	6
Online tests	<i>Replace regular tests with online assessments.</i>	6
Digital Materials for English Learning	<i>Use as teaching material to improve listening skills.</i>	5
International exchange using Zoom	<i>Provide an experience similar to studying abroad to improve learning effectiveness.</i>	4
Google Classroom	<i>More efficient assignment management and grading.</i>	3
iPads and electronic whiteboards	<i>Promotes exchange of opinions among students.</i>	3

Table 6. Q15 Choose the English skills you think technology will be beneficial for improving. (Multiple answers allowed)

Category	Example reflections	Entry
Developing Speaking Skills	<i>Use video chat apps to talk to English-speaking people. Increase opportunities to speak using technology.</i>	15
Improving Vocabulary	<i>Mobile apps like SANTA TOEIC analyse students' weaknesses.</i>	12
Improving Listening Skills	<i>Provide an environment where students can improve their listening skills at their own pace.</i>	12



Improving Writing Skills	<i>Improve writing skills using tools like Grammarly.</i>	12
Improving Presentation Skills	<i>Tools like PowerPoint or Canva help create visually appealing presentations.</i>	6

These tables illustrate participants' perspectives regarding the role of ICT in English education, the technologies they believe are most effective, and how they plan to incorporate these tools into their future teaching practices. The reflections highlight common themes around reducing teacher workload, enhancing student engagement, and promoting autonomous and active learning.

5. Discussion

The positive feedback from participants highlights the courses' effectiveness in preparing teacher trainees to integrate ICT into their future classrooms. The balance between practical hands-on experience and theoretical knowledge gave students a comprehensive understanding of implementing technology in educational settings. Participants reflected on the various roles that ICT can play in English language teaching, ranging from reducing teacher workload to enhancing student engagement.

One of the key insights from the study is the perceived ability of ICT to reduce the administrative burden on teachers. Tools such as Learning Management Systems (LMS) were frequently mentioned as valuable for streamlining tasks like grading and managing student assignments. This aligns with broader trends in education, where technology is increasingly being used to automate routine tasks, allowing teachers to focus more on instructional quality and student interaction.

Another major theme was the potential of ICT to foster more personalised and supportive learning environments. Many participants noted that digital tools provide immediate access to information and allow for tailored learning experiences. For example, AI-based tools can analyse student performance and offer individualised tasks, helping students address specific weaknesses in language skills. This kind of personalisation enhances learning and increases student engagement by catering to their unique needs.

Participants also highlighted the role of ICT in facilitating global connections. Technologies like Zoom allow students to engage in collaborative projects with peers worldwide, enriching their learning experiences and fostering a broader, global perspective. This is particularly relevant in the context of English language education, where exposure to diverse cultures and communication with native speakers can significantly enhance language proficiency.

Another significant finding was using specific digital tools to improve core language skills—such as writing, listening, speaking, and vocabulary. Tools like Grammarly for writing and apps like SANTA for vocabulary development were identified as particularly useful. These technologies support skill development and provide real-time feedback, allowing students to practice and improve at their own pace.

The reflections on how ICT can enhance student autonomy are also noteworthy. Many participants recognised that digital tools offer students more control over their learning, enabling them to explore topics of personal interest and practice language skills independently. This aligns with modern pedagogical approaches that emphasise learner autonomy and self-directed learning.

Finally, the study highlights the importance of critically reflecting on the integration of ICT in education. While participants were generally positive about the benefits of technology, there was also recognition of its limitations. Some reflected on the need for a balanced approach, ensuring that ICT complements, rather than replaces, effective teaching practices. This critical perspective is crucial for future educators as they navigate the evolving role of technology in the classroom.

6. Concluding Remarks

The courses have provided teacher trainees with valuable skills and knowledge, preparing them for modern classrooms. One of the main things students gained was confidence and competence in using various digital tools for teaching English. This includes basic technological skills and the ability to integrate these tools into pedagogically sound teaching strategies, fostering a more interactive and engaging learning environment.



Through these courses, teacher trainees learned to utilise Learning Management Systems (LMS), mobile applications, and web conferencing tools to enhance student engagement, support individual learning needs, and facilitate global connections. They also gained a deeper understanding of how ICT can reduce the administrative burden on teachers, allowing them to focus more on instructional quality and personalised feedback. Incorporating specific tools for each language skill, such as Grammarly for writing and ELSA for pronunciation, gave trainees a practical toolkit they could apply directly in their future classrooms.

Moreover, the trainees learned how to approach ICT critically, understanding its benefits and limitations. They explored how to balance technological integration with pedagogical goals, ensuring that the use of ICT enhances rather than replaces effective teaching practices. This reflective aspect of the course encouraged trainees to think deeply about how to incorporate ICT in ways that align with their student's needs and the objectives of their lessons.

7. Implications

These courses have shown that teacher trainees can move from feeling unsure about ICT to becoming confident, skilled users who creatively incorporate it into their teaching. This suggests that future teacher training programs should focus on hands-on practice with ICT, ensuring that trainees become technically proficient and learn how to use technology to meet specific learning goals and encourage global collaboration.

It is also important that teacher training programs continue to include reflective practice, as it helps future teachers think critically about when and how to use ICT in their lessons. By using frameworks like TPACK, programs can ensure trainees understand how to connect technology with content and teaching methods, allowing them to design practical lessons that use ICT in meaningful ways.

Lastly, as ICT fosters more global connections, future teachers who learn to use these tools for international exchanges will be well-prepared to create student-centred, globally connected classrooms.

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