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Editors' Note

STEM education drives a transformative shift in learning, integrating disciplines and promoting experiential learning. It fosters critical thinking, problem-solving, and inquiry-based exploration, equipping learners for success in the 21st century. Through hands-on projects and collaboration, STEM nurtures innovation and creativity, preparing students to tackle complex challenges in an interconnected world.

STEM education fosters innovation and creativity by integrating science, technology, engineering, and mathematics. It empowers students to transcend disciplinary boundaries through hands-on learning, cultivating ingenuity and resourcefulness. This approach promotes inquiry-driven exploration, encouraging students to take ownership of their learning and develop essential lifelong skills for navigating a dynamic knowledge landscape.

In the first paper ***"Forbidden Island: a Tool for Fostering Task-Based Learning,"*** the research laid out uses the collaborative board game Forbidden Island as a task-based learning tool. The game presented a task that required communication between the players for successful completion. Participants completed a questionnaire to gauge the impact of the game on their English language skills. The data showed that students believed Forbidden Island was a useful tool for increasing their listening, reading, and speaking skills. Additionally, participants expressed a positive view of board games as beneficial for improving their English proficiency.

The second paper "***Patterns of English Usage in Manga: A pilot study"*** explores the usage of English within mainstream manga which is designed and marketed towards four different audiences: shoujo (female 12-18 years old), shounen (male 12-18 years old), jousei (female 18-30 years old) and seinen (male 18-30 years old). The findings show that the way English is used in manga affected by the sex and age of the intended audience. Manga marketed towards the different audience demographics shows gendered patterns with respect to the number of tokens used, the frequencies with which they appear, their location within the manga's text and art, as well as the orthographies in which they are written. Further analysis of these patterns shows that the different uses of English

adhere to commonly held cultural beliefs and serve to reinforce various gender stereotypes.

The third paper *"Job Analysis of Junior High School Living Technology Teachers in the 12-Year Basic Education"* presents the technology domain, which is a major focus of the 12-year basic education. The main purpose of this research is to explore the work content of junior high school living technology teachers under the 12-year basic education. The semi-structured interview questions are developed according to the research purpose, and the work content of junior high school living technology teachers under the 12-year basic education is confirmed. The interviewees have relevant experience and achievements sufficient to answer the interview questions and are composed of living technology teachers, directors, and principals with undergraduate degrees in living technology.

The fourth paper *"Difficulties and Strategies Countermeasures of Promoting TTQS in Small and Medium Enterprises in Taiwan,"* responses to the international talent training trend, Workforce Development Agency (WDA) which has developed a set of systems training quality system in Taiwan—Talent Quality-management System" (TTQS). TTQS has been promoted for more than 15 years since 2007, And it has been used by thousands of companies. However, the actual use of enterprises accounted for no more that 1% of the country. This article discusses the dilemma of TTQS in small and medium enterprises, and propose countermeasures to WDA.

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Forbidden Island: a Tool for Fostering Task-Based Learning

桌遊《禁島之島》：促進任務型學習的教具

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Abstract

Various pedagogical methods are currently employed in different ESL and EFL contexts. Some places still adhere to traditional, teacher-centered methods. However, a positive shift has occurred as many institutes are moving away from conventional teaching methods towards more student-centered approaches such as communicative language teaching (CLT) and task-based learning An effective strategy to foster student-centered learning involves incorporating materials in the classroom that engage students in active communication to complete tasks collaboratively. The research laid out in this paper uses the collaborative board game Forbidden Island as a task-based learning tool. The game presented a task that required communication between the players for successful completion. Twenty-four participants completed a questionnaire to gauge the impact of the game on their English language skills. The data showed that the participants believed Forbidden Island was a useful tool for increasing their listening, reading, and speaking skills. Additionally, participants expressed a positive view of board games as beneficial for improving their English proficiency.

This paper is an expansion to a shorter paper published in Kanda University of International Studies, Japan, in-house journal (Manley, 2018). The details laid out in this paper provide a more detailed and fuller picture about the research completed as the word count is more gracious.

Keywords: Task-based language learning, board games, Forbidden Island, communicative language teaching

1. Introduction

The research laid out in this paper focuses on communicative language teaching (CLT) and considering how a task-based learning (TBL) activity can be applied to foster CLT using a board game. The field of CLT is vast, and there is no general consensus on what set of practices it comprises (Brandl 2007; Richards 2006). However, a basic definition would be that CLT provides students with an opportunity to practice and improve communication skills such as speaking, instead of only memorization found in many traditional classrooms. As a way to implement CLT, TBL focuses on motivating students to participate by giving them tasks and goals to complete. In this research, the collaborative game *Forbidden Island* is used to combine CLT and TBL in a constructive way in the classroom. The game mechanics provide a common group goal (TBL). To accomplish this task the group of players must communicate and come to an agreement about how they will act to win. Some types of communication that typically occur during the course of playing the game are: negotiation, predictions of the future, and the planning of each players moves.

The aims of this study are to investigate student perception about which communication skills increased through playing a board game, to find out if students find board games beneficial for practicing communication skills and explore the benefits related to their enjoyment of the game. Lastly the project investigates student perception on whether having a game provided goal motivates and builds confidence in the students. This project was divided into two phases: the pilot study (phase one) and the primary study (phase two). A questionnaire was used to elicit student perceptions on their motivation, confidence and skills levels and how they were affected by the game. It is important in the field of education to elicit student perceptions on their learning because if students feel motivated, they are more receptive of the information surrounding them (See *Affective Filter Hypothesis* - Krashen & Terrell, 1992). A mixed methods approach, through triangulation, is used to analyze the results from the questionnaire. Lastly, implications and findings for this research are discussed along with limitations and future possibilities.

2. Theoretical Background

In the field of English language teaching, many types of pedagogic methods have been, and are currently being used in ESL and EFL teaching and language learning, methods such as the natural approach (Krashen & Terrell, 1992), the silent way (Gattegno, 1972), and the audiolingual approach (which drew on the linguistic framework constructed by L. Bloomfield). Though English language teaching has a long history, my focus is on CLT, which came about to address the shortcomings of previous approaches. Hromek & Roffey (2009) state that "[u]ntil the late 1960's, the dominant paradigm for teaching and learning involved information transfer by experts to learners, using instruction [sic] technologies such as books, lectures, and articles, with success measured by written examination" (p. 630). The paradigm Hromek & Roffey (2009) refer to is the audiolingual and grammar translation method, which are still commonly used in some countries (Hall, 2011; Hu, 2002; Nunan, 1999).

In these traditional education systems, students are taught to memorize the rules of grammar, rather than be given the opportunity to communicate with each other (Nunan, 1999). In addition, students were limited to a passive role (Li, 1984) and only copied the language given to them rather than learning how "to respond appropriately in novel and authentic communicative situations" or "us[ing] language creatively themselves" (Nunan, 1999, p. 75). In the same vein, Butler (2011) stated that in traditional educational systems, little emphasis "was placed on the acquisition of knowledge for practical purposes" (p. 40), instead the teacher had "profound knowledge, and the student [w]as the recipient of that authoritative knowledge." (p. 40). Other studies critique traditional approaches including Diallo (2014), who argues that traditional methods in Senegal "never [gave students] opportunities to use their language skills in any communication context… [and] students' poor outcomes and low standard in English were attributable to the teaching methods" (p. 144). In addition, Rao's (2002) research found that most of their student participants in China liked both communicative and traditional activities, but since their goal was to pass national grammar based tests, traditional methods of teaching were preferred.

The next stage of English language teaching occurred early in the 1980s when "[l]anguage was seen as a system for the expression of meaning, and linguists began to analyze language [as such]..., rather than as a system of abstract syntactic rules" (Nunan, 1999, p. 9). This shift in attitudes towards language learning led to the development of CLT (Celce-Murcia, Dornyei, & Thurrell, 1997). Today, CLT is a growing method of English instruction in many ESL and EFL settings which is not to say that it is completely without issues, e.g., in Uzbekistan (Hasanova & Shadieva, 2008), South Korea (Li, 1998), Senegal (Diallo, 2014), and China (Anderson, 1993; Rao, 2002). In Shamim's (1996) report on introducing CLT into a Pakistani classroom, she found that her students preferred lectures over having group work and discussions (p. 108). This might have been due to the fact that the "learner's [had] beliefs and assumptions about the norms of appropriate classroom behavior shown to be entrenched in the culture of the community [and these] clashed with the assumptions of the innovative methodology [CLT]" (p. 119). Many of the issues seen in the examples above, however, came not from CLT but rather from domestic factors which prevented the teachers from utilizing the method to its full extent. Some of the domestic problems faced by teachers were: issues between western style teaching conflicting with the culture of the learners (Anderson, 1993; Butler, 2011; Diallo, 2014), and low motivation toward CLT due to students focus on grammar for national entrance exams (Liu, 2015). Although the aforementioned problems have hindered CLT's uptake in parts of the world, many researchers, including the ones above, stressed the importance of CLT, some of which reported that many of their participants, perceived it as positive and necessary (Chirciu, 2011; Savignon & Wang, 2003; Sobhani & Bagheri, 2014).

Though it is not possible to instantaneously address all the problems with implementing CLT in countries with traditional classrooms, my research hopes to remedy one of the problems that limits the use of CLT in the classroom: materials used for fostering communication. In Japan, the English curriculum focuses on traditional methods in the classroom (Butler, 2005; Nishino, 2008). This project attempts to expand on traditional teaching methods by incorporating a task-based collaborative board game, *Forbidden Island*, as a material that makes use of CLT learning methods.

If this game is seen as an effective tool for promoting communication and language learning, implementing it and other similar games could be beneficial in traditional classrooms.

CLT is "a set of principles about the goals of language teaching, how learners learn a language, the kinds of classroom activities that best facilitate learning, and the roles of teachers and learners in the classroom" (Richards, 2006, p. 2). Communication is the central focus which is complemented through the use of authentic materials, or materials made for native speakers, and "task-based and goal-oriented activities…" (Wang, 2010, p. 130). Kumaravadivelu (2006) adds to this by stating it is "concerned with the concepts of negotiation, interpretation, and expression" (p. 61), making use of "activities that have the potential to carry elements of unpredictability and freedom of choice," (ibid, p. 61).). This method also grants student's autonomy to engage in collaborative practice, fostering learning through trial and error (Richards & Rodgers, 2001, p. 172). Finocchiaro and Brumfit's (1983) interpretation of Wilkins (1972, 1976) functional-notional (F-N) approach laid out the underlying principles of CLT (see also Richards & Rodgers, 2001). The principles of CLT as set out by Finocchiaro and Brumfit (1983) in a chart (p. 91-93) which relates directly to the primary study (phase 2) are:

- "Language learning is learning to communicate" (p. 91).
- "Any device that helps the learners is accepted - varying according to their age, interest etc" (p. 91).
- "Students are expected to interact with other people, either in the flesh, through pair and group work, or in their writings" (p. 93).

Finocchiaro & Brumfit's (1983) "language learning is learning to communicate" relates to the strong version of CLT which gives learners classroom activities that place them in situations where they must use language they have already acquired inventively in order to communicate. This approach is echoed by researchers who claim that learners learn a language when they are producing it (Swain, 1995).

Another important sub-form of CLT is task based learning (TBL) which provides students with

opportunities to use language in the classroom. Nunan (2004) exemplifies the difference between CLT and TBL when he says:

> CLT is a broad, philosophical approach to the language curriculum that draws on theory and research in linguistics… Task-based language teaching represents a realization of this philosophy at the levels of syllabus design and methodology. (p. 10).

Put simply, the overarching pedagogy is CLT (Dornyei, 2009, p. 278, Ellis, 2003, p. 27-31) where "communication itself [is]...the central process and focus" (Hall, 2011, p. 94) and TBL is one way to apply CLT. TBL in an ESL or EFL setting consists of giving the students a task, or goal to complete that requires participants to use authentic language to communicate with each other. There are two categories for the word "task" that Nunan (2004) classifies; target tasks which "...refer to uses of language in the world beyond the classroom" and pedagogical tasks "...those that occur in the classroom" (p. 1). Pedagogical tasks function as a connection between the classroom and the outside world (Brandl, 2007). These tasks are significant because they test whether students' can take the principles they learned in class and apply them to situations encountered outside the class (Littlewood 1981).

The use of collaborative board games to provide pedagogical tasks as a way to develop general language proficiency is the foundation of this research project. Board games can support CLT classes (Richards & Rodgers, 2001) and may become forms of TBL by providing tasks wherein students apply the language they have learned and thus increase their competency. Since the completion of a game is in itself a task, almost any game can fit into the category of task-based materials. Students are encouraged to be invested in the game as they are in some control of what will happen and can make choices (Kapp, 2012).

One focus of CLT is to foster authentic conversations. The classroom acts as a microcosm where students are given opportunities to foster and apply the language skills they already have as well as to experiment freely and possibly increasing their proficiency through such experimentation. In

traditional classrooms, materials and language presented to learners are often simplified in order for the students to acquire what it is being taught (Widdowson, 1990) and that classrooms can become "artificial," using structured conversations, and unnatural dialogues, often found in textbooks or other material (Washburn, 2001). The simplification of genuine communication may cause students to face difficulty when they go outside the classroom and attempt to find the right situation in which to insert their set phrase. However, unscripted language in the classroom gives students a chance to freely use language (Li, 1984), which can give them practice for experiences outside the classroom, where they will have to adapt to the natural flow of conversation around them. Games such as *Forbidden Island* can help create a class environment that promotes spontaneous interactions.

Forbidden Island is not only a tool to foster CLT, but it can also be considered an authentic material because it is material that was made for native speakers. Authentic materials present the language as used by native speakers and contains registers commonly seen in naturally occurring language that has not "been concocted by a textbook writer" (Nunan, 2004, p. 27). Authentic materials should give "learners a taste of the real world, an opportunity to 'rehearse' in a sheltered environment" (McGrath, 2022, p. 105). Hall (2011) strengthens this idea when he states learners should be given models of how language is actually used and then required to complete tasks that offer a genuine opportunity to replicate natural speech in order to prepare the students for the real world (p. 192).

Collaborative games not only encourage authentic language but they also fall under the definition of a task based material. Most games have a particular objective (Kapp, 2012), a way of doing things through instructions and choices, and different outcomes based on player actions. Many games are also quite complex with problems arising that necessitate individual or group cooperation to solve (Kapp, 2012; Krashen & Terrell, 1992). With collaborative games, players communicate to reach particular goals, thus making these games useful communicative language development tools. McGrath (2002) gives four requirements that constitute a useful language developing activity: exposure, opportunity, motivation and feedback. Games are materials that can meet these four conditions. They help students experience a variety of language situations, offer chances to practice

language through in-game discussions, boost motivation with specific goals and provide feedback, such as winning or losing parts of the game. Emphasizing this, Krashen & Terrell (1992) state that games are effective language learning tools due to the students' investment in the outcome of the game rather than focusing on grammatical forms or structures. These positive aspects of using games to learn a language support Finocchiaro & Brumfit's (1983) approach that states "any device [i.e. a game] that helps the learners is accepted" (pg. 91).

Games do not only foster communication, but also compel players to use various types of communication techniques, such as negotiation and discussion, which are inherent to collaborative games (Bouvier, Lavoue & Sehaba, 2014). When using the "device" (Finocchiaro and Brumfit, 1983) of games in a CLT environment, learners can acquire a language by being placed in contexts that push them to communicate in the target language (Littlejohn & Hicks, 1987; Richards & Rodgers, 2001; Swain, 1995). For example, in the board game *Forbidden Island,* the players must work cooperatively to successfully complete the game. Furthermore, the players need to negotiate with and convince others to follow a certain course of action, even when it is not actually that individual's turn. Since players will have differing opinions about the many possible paths they should take, they must predict a series of events based on player moves and come to an agreement about which is the optimal course. Through their "in-the-flesh" (Finocchiaro and Brumfit, 1983, p. 93) communication using the game, the participants practice skills, such as persuasion and negotiation that can be applied to situations outside the classrooms.

As can be seen above, there has been a plethora of research into games as useful tools with potential pedagogic benefits in communicative classrooms (Krashen & Terrell, 1992; Peterson, 2010, 2012; Rankin, Gold and Gooch, 2006; Richards & Rodgers, 2001). However, a problem arises in the arena of assessment. Learning is often assessed through grades (Lizzio, Wilson & Simons, 2002) and standardized testing. Despite this, student perception on whether they have learned or not is just as important as if they took a test telling them they did (Picciano, 2002, p. 22). Outside the classroom there are no written or oral tests that will be graded. Students must learn to communicate (Finocchiaro

& Brumfit, 1983), through structured tasks in the classroom and through individual trial and error. The perceptions they have towards the success of these interactions is a type of self-feedback based on the instant reactions and feedback they receive from their "in the flesh... pair and group work" (ibid, p. 93).

There have been researchers who studied student perception on learning and how it relates to actual gains in language ability (Hirschel, Yamamoto, & Lee, 2012), including research on student perception towards increased English skills from playing video games (Chen & Yang, 2013). However, present literature neglects investigation into student perception on the improvement of their communicative language skills through a task-based collaborative board game. Filling in this gap will be the focus of my research wherein I examine students' perception on whether they have improved the language skills of reading, listening and/or speaking through their gaming experience using *Forbidden Island*.

3. Methods

This paper makes use of the body of research that has investigated task-based learning outcomes through the use of questionnaires and interviewing of the participants (Peterson 2010, 2012; Ranalli 2008; Sobhani & Bagheri, 2014; Rankin, Gold, & Gooch, 2006; Shahriarpour & Kafi, 2014; Wu, Chen & Huang, 2014; Zheng, Wagner, Young, & Brewer, 2009). Rather than solely depending on the pre- and post-test model of questionnaire design (Wu, Chen & Huang, 2014), I designed my own questionnaire that specifically addresses learners' attitudes and perceptions. My research is different from current literature in that it focuses on student-perceptions and how they believe their language skills improved through playing the game *Forbidden Island*.

The study starts with students learning about the game and then playing it with group members. Once game playing sessions concluded, participants responded to questions (see appendix A & C) aimed at gauging their perception of whether specific language skills had improved as a result of playing the game. The questionnaire contained a Likert-scale (Hirschel, Yamamoto, & Lee, 2012),

open ended questions (Chen & Yang, 2013), and closed questions. A Likert-scale was used to get quantifiable responses. I implemented open-ended and closed questions to elicit feedback on students' perception of their English skills after playing the game. The types of data collected provided me a way to evaluate the efficacy of these activities through triangulation.

After the students answered the questionnaires, only the phase one players participated in follow up interviews (see appendix B), the reasons for which will be discussed in section 3.3. I chose the method of interviews because I wanted to ask students follow up questions about their gaming experience that were not asked on the questionnaire and to clarify any responses they had given on the questionnaire.

Video recordings were also used as a means to collect data. There is a long history in the body of research that uses this method to help the researcher measure outcomes (Kobayashi, E. Kobayashi, M. & Fujimura 2014). In my study, video recordings will serve two purposes: one student centered and one researcher centered. The student centered reason is to help the students remember what occurred during their game sessions. In Kirschner & Williams' (2014) study, the researchers gave participants the task of playing World of Warcraft. Their participants were video recorded and later asked to go over the footage of themselves, using the think-aloud protocol. In phase two, I used a modified version of the think-aloud protocol. Students were tasked with filling out the survey while watching their recorded gameplay. The modified version gave the participants more direction and differs slightly from the think-aloud protocol because it involves writing as a medium. The videos provided students the opportunity to self-reflect from a more objective point of view (Hirschel, Yamamoto & Lee, 2012). Also, there is a possibility that the participants will not remember what types of communication and interactions transpired during the game play, therefore the videos can be used to help them remember what occurred (Hirschel, Yamamoto & Lee, 2012). The second purpose was for my records as a researcher. During the latter gaming sessions, I was not present in the room therefore having the video recordings was essential. This allowed me to review and understand the participants' interactions and responses to the questionnaire.

As can be seen above, the design of this research project makes use of various types of data gathering techniques. In addition, I incorporate two major types of data analysis methods in the project: quantitative and qualitative analysis. Different proponents argue that one method should be used over the other, whilst some researchers advocate mixing the two (Johnson & Onwuegbuzie, 2004) as the best solution because it provides "answers to a wider range of research questions" (Angouri, 2010, p. 30). It seems that the best way to determine which method to use is to consider the needs of the researcher, the intent of the research, the research questions, and the project (Angouri, 2010). The researcher should choose the method based on which one can provide results for the research questions (Johnson & Onwuegbuzie, 2004). For my research, I chose a mixed methods approach to validate my results by comparing both types of data to see if they correlate with each other (Creswell & Plano Clark, 2007). The combination of the two through triangulation can provide a "more complete picture" (Creswell & Plano Clark, 2007, p. 33) by having "trends and generalizations" (p. 33) from quantitative, and "in-depth knowledge of participants' perspectives" (p. 33) from qualitative data.

3.1 Forbidden Island

Using the theoretical framework discussed previously, I chose *Forbidden Island* because it is an authentic game that contains tasks, such as collecting figures, exchanging cards, and collaboratively winning the game. It requires everyone to participate, and communication is necessary, as compared to non-collaborative games, such as monopoly, that do not necessitate collaboration nor does it have an in-game requirement to collectively win. The only possible way to win *Forbidden Island* is through teamwork. However, if one player 'dies' or if the treasures become unattainable, everyone loses the game. Lastly, this game is also a fairly simple game in terms of the rules, time it takes to complete, and gameplay, when compared to other more complex cooperative games, thus making it easier to explain and teach to ESL students.
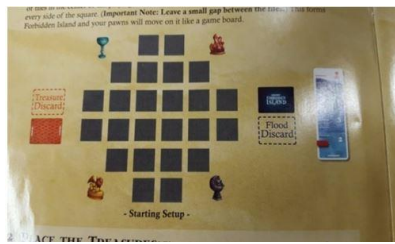
Image 1a: Game setup in the instruction manual.
Image 1b: Setup of the board.
Image 2: Prior to the start of the game, six tiles must be turned over to indicate that they are flooded.
Image 3: If there are no tiles adjacent to their current position for a pawn to "swim" to, the player "dies" and everyone loses the game.
Image 4: Starting point of pawns.
Image 5: Tiles where players trade Treasure Deck cards for the corresponding treasure, all are needed to win the game.
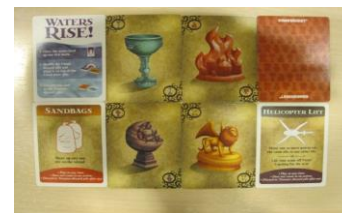Image 6: At the end of the game, everyone must reach this tile to get off the island.
Image 7: Treasure Deck cards - treasure cards, sandbag to unflood a tile, helicopter card to fly anywhere, anytime and off the island, and water rise card.
Image 8: The Flood Deck. When a card is flipped, the corresponding tile either floods (tile is flipped) or sinks (if already flooded previously). |
Image 9: Adventurer Cards - Roles with special abilities given to the players at the beginning of the game. |

(continued)

Image 10: Order of Play and Actions.

Image 11: Water Meter - determines how many "Flood Deck" cards and tiles need to be flipped.

Image 12: Treasures.

*the texts under the images are kept verbatim from the first published work (Manley, 2018).

(3.1.1) How to Play

Image 1a is the setup for Forbidden Island; however, since the table in the actual data collection environment was smaller, image 1b shows the game setup for my research. The card decks (image 7 & 8) were placed on an adjacent desk. The tiles are randomly chosen and placed. Once setup is complete, six cards are drawn from the "flood deck" (image 8). The tiles with the same image of the drawn cards are flipped, where the tiles color was now light blue (image 2). The six cards go into a discard pile. When a "water rise" card (image 7) is drawn, the discarded cards are re-shuffled back into the deck. Adventurer cards (image 9) are randomly given to the players. They then place their characters colored pawns on their corresponding tiles (image 4). A benefit of having different roles in a collaborative board game is that it can stimulate collaboration among the players, where they have to communicate how they can utilize their abilities to win the game (Linderoth 2011), thus giving it qualities of CLT. After distributing the role cards, each player is provided two cards from the "treasure deck" (image 7). If a "water rise" card is given at the first distribution of the cards, it goes back into the deck (and is not counted). The water meter (image 11) increases by one whenever a

"water rise" card is drawn. At the end of their turn, each player draws two cards from the "treasure" deck and the amount of "flood" cards as are indicated on the water meter.

To win the game, players need to collect all four treasures (image 12), get to the helipad "fool's landing" (image 6) and fly off using and discarding a "helicopter lift" card (image 7). The players lose the game if both same treasure tiles sink before the players retrieve the corresponding treasure. For example, if the players have not received the "Crystal of Fire" figure (image 12) yet both the "Cave of Embers" and "Cave of Shadows" tile (image 5) sink, everyone loses the game. Other ways for the players to lose the game is if "fool's landing" (image 7) sinks, if a tile a player is on sinks and there are no adjacent tiles for them to swim to (image 3) - with the exception of the Explorer, Pilot, and Diver. Lastly, the players can lose the game if the water meter hits the skull and crossbones (image 11).

Both phases of the research implemented aspects of CLT, where the players played the game without any guidance from the teacher, aside from learning how to play via the rule book and tutorial. Once the game started they were given free reign, and were not given any script, grammar, or cues to say while they played the game. This method of CLT was chosen because I wanted to see what linguistic features appeared during the participants' natural interactions with each other that could possibly be used for future research.

3.2 Participants and Procedures

(3.2.1) Participants

The participants were from Kanda University of International Studies (KUIS). All students are Japanese and non-native English speakers. However, the participants are distinguished between those who took part in phase one and phase two. Phase one focused on four participants. However, the small sample size did not yield robust enough responses and the data collective device needed some revision, therefore it was decided that a larger sample size and a refined collective device was needed, thus there was a second round of data collection which included 20 participants and a new

questionnaire.

(3.2.2) Ethics

Both phases were considered low risk for ethical implications. The participants were not harmed in any way. The only requirement the participants had was to play the game, answer questions from a questionnaire, be interviewed, and consent to being video recorded. At the start of both projects consent forms, provided by KUIS and approved by The University of Birmingham, were given to participants. The researcher went over the ethics form with the participants and gave them a signed copy for their own records. The participants from phase one were allowed to withdraw from the research at any time. They were compensated at the end of the research with payment from KUIS research funding. If a member left before they finished the research, they would be compensated for the time they were present. As for phase two, the members were part of my English class, and they were required to play the game and complete the questionnaire as part of a class assignment. Although they could not resign from the experiment because it was considered a class assignment, they could have their data removed.

(3.2.3) Selection Criteria

The first requirement was that none of the participants had played the game *Forbidden Island* before. The other was that the participants had to be all freshmen. Phase one had four female participants, who were residents of the same, all-female dormitory where I acted as a monitor. They were all aged 18 or 19 years old and studied in either the English or International Communications Department. The English ability varied because they were volunteers from different classes and had not been placed in the same level by any kind of diagnostic test. There were no student-teacher relations between myself and these participants since I work in a different department.

The amount of participants and answers were not sufficient to make any conclusions in phase one, so the project was redesigned and improved to generate more valid results and data. The

participants in phase one were of mixed language levels, which made the data difficult to interpret. This led me to choose phase two's participants who had all tested into the same level in my freshman English class.

The second phase had 20 participants, three were male and 17 were female, between 18 and 19 years of age. The language level of the students was second from the highest tier, based on a speaking test and their TOEIC scores prior to attending the university, (see section 3.5), and the majority of the students were very fluent in their English speaking abilities. The participants for the study were from the multiple languages department, which includes Vietnamese, Thai, Portuguese, and Indonesian majors. It is compulsory for the students to take English classes their first two years at the university. Since the game is played by two to four players, the freshman class was divided into five groups of four players, using an online random number generator.

(3.2.4) Procedures for Observation

Video recordings were the tool for gathering observational data. I chose to video record the games played after the initial explanatory game to mitigate the observer's paradox where the presence of a researcher can affect the production and actions of the participants, thereby possibly tainting the results of the data. Although there are those who could argue that having a camera recording the participants could also introduce an element of the observer's paradox, it seemed to me that it was a better alternative than being present in the room. In addition, due to the scheduling of the freshman English class, it took a few weeks for the same group to play the second iteration of the game and complete the questionnaire. Thus students could watch their recordings to remind them of what happened in the first game. Lastly, the recordings were used to transcribe the dialogue. Using a video camera I could observe the actions and language of the players without being physically in the room. This allowed me to listen to the students speaking and to see the context in which the interactions were produced. Visual cues using gestures and moving of game pieces allowed me to understand what the participants were doing much more effectively, while providing me with more data to study.

(3.2.5) Procedure for Data Gathering

Prior to the gaming sessions, participants in both phases were given an orientation to the game similar to that used by Rankin, Gold & Gooch (2006). In phase two, I used the researchers approach and provided students with an orientation that included introducing vocabulary, game mechanics and a copy of the instruction manual. I expanded the orientation further by letting the students play a demonstration game while I was available to answer questions and give examples. I used this demonstration game approach once in phase one and three times in phase two. Due to the size of the freshman English group in phase two, the class played once as a whole and then in smaller groups to ensure that the students could play the game through on their own without input from me. The language from the demonstration games is not included in the data.

The members in phase one met seven times in the course of the research. These meetings took place in the dormitory common room. The first and second meeting times were orientation days. The participants played the game four times afterwards on different days. The game time ranged anywhere from thirty minutes to forty-five minutes. There was no time limit for the students and they could play the game until they either won or lost. For the first of the four gaming sessions, I was present to address any questions the participants had, as well as video record the participants playing the game to make sure the technology was working properly. For the next three sessions the students were only video recorded and I was not present.

After each gaming session, the participants were required to fill out a questionnaire (see appendix A) in English only, for a total of four questionnaires per player. The participants completed the questionnaire in their own time. The deadline was a month after the last game and students had access to their videos through a shared folder on Google drive. At the end, the participants set up meeting times with the researcher for individual 10 minute interviews which took place in the common room of the dorm (appendix B).

For phase two, the gaming sessions took place during class time. On the first day, students were

given the game's instruction manual and I explained the rules of the game using the board game itself, such as holding up the tiles (image 1b) to show the students the layout of the island as well as the different deck of cards and their uses (image 7-9). For the second orientation class the students watched a YouTube video of Wil Wheaton's show TableTop where he plays the game with three other people. Wheaton's video was chosen because he gives a clear explanation of how to play the game, while playing it. The video was also chosen because the results of phase one showed that the participants needed more guidance on how to play. Although we watched the video in class, the students had access to the video on YouTube. During the third orientation class, I had students volunteer to play the game while other students watched. I had two copies of the game so two groups could play concurrently. When one group of volunteers finished, another group would start playing. Once the orientation days were over, each group played the game twice in rotation. I was present the first time they played, to make sure there were no problems with the technology and to make sure the participants knew how to play the game properly.

Phase two's participants only played the game twice rather than the original four times the group in phase one played. This was due to phase one having few observable differences in any of the games, the questionnaires, or the interview, suggesting that the additional rounds of game playing were merely duplicating data rather than fostering new information. Once the participants in phase two were finished with both gaming sessions, they answered a single cohesive and succinct questionnaire in English (see appendix C), rather than one questionnaire for each gaming session.

3.3 Design of Data Collection

This research was made up of a pilot study (phase one) and the current study (phase two). Phase one made use of all the data gathering tools that were mentioned above: the initial questionnaire while watching video recordings, and the follow-up interviews. Fortunately, phase one showed me some places where the design of the research tools needed to be refined. Phase one only contained open ended questions and this proved to make it difficult for me to draw broad conclusions. For this reason,

I modified one question to be answered by using a Likert scale, which provided more specific and directly comparable answers. I found that keeping the open ended opinion questions as a follow up to the Likert scale question provided the participants with sufficient space to express their thought process which eliminated the need for follow up interviews. Also, having the quantitative Likert scale results to compare with the qualitative open ended opinions allowed me to triangulate the data and see the relationship between different aspects of the results.

There were a total of four research questions. The first two can be found in (Manley, 2018), with question three and four answered in this paper:

1. What English language skills do students believe are increased through playing collaborative games? (Manley, 2018)

2. Do students perceive games as beneficial for practicing English language skills? (Manley, 2018)

3. Does perceived benefit correlate with student enjoyment of games?

4. According to student perception, does having a goal or task motivate students to play games and build confidence?

The first item on phase two's questionnaire explored the affective responses of the students to playing *Forbidden Island.* This question asked simply if they enjoyed playing the game and how much, thus relating to research question three. I used a Likert-scale so that students gave me specific, quantifiable and comparable data on how much they enjoyed the game.

Question two on the questionnaire was one of the points at which phase one and phase two differed. Phase one originally asked participants to identify which skills improved through the game and then asked them "why do you think so?" However, the responses from the participants in phase one were relatively lacking in specific detail. For example, S2 (student 2 from phase one) said "because we have to use these skills to solve problems" however, this statement did not give me context or explain how the skills they chose increased. This led me to change the questionnaire by adding "please provide at least two examples and explain." My aim in phase two was for participants

to provide specific examples of how and when they thought their skill increased. For example, G4S1 gave a specific context where they practiced their speaking skill, saying, "We discussed often, so I had to speak and telling my opinions. In the game someone is asking me 'I don't understand my ability card, so could you please tell me what is this card saying?' And I translate what this ability card is saying."

Question 11 and 12 on the questionnaire addressed research question 4 and the theoretical basis of TBL by asking the students directly about the impact of tasks and goals. Question 11 asked if they felt having a goal or a task provided them with motivation to play the game while question 12 asked if completing a task helped them to gain confidence and motivation. Answers to these questions would give evidence about whether or not TBL is a useful tool for building motivation or confidence and if board games which contain aspects of TBL have value as an education tool.

3.4 Results & Discussion

Research question one and two were previously published in Manley (2018). However, I provide a brief summary. In Manley (2018) students in the study "believe that their speaking skills, and to some extent their listening skills, had improved" (p. 36). Students mentioned they had to communicate with each other when discussing, negotiating, and collaborating in order to explain their ideas and decide which plan would help them complete their tasks and reach the goal of winning the game. This suggests that games have the potential to be used as a TBL activity to promote CLT in an EFL setting since the mechanics of games provide students "in the flesh" (Finocchiaro & Brumfit, 1983) communicative opportunities. Table 1 shows which skill students believed they improved most.

Table 1

	Reading	**Listening**	**Speaking**	**Other**
Phase One*	3	3	4	1 (Argument Skills)
Phase Two**	0	5	12	3 (Listening & Speaking)

* Phase one's participants had four questionnaires to answer, thus they could choose more than one choice for which skill they improved on, often times choosing the same skill more than once across all four questionnaires. Thus for the table, the results show how many participants chose each skill, regardless of how many times they chose it.

** Number represents how many students chose the skill, for example, five students chose listening as the skill they improved on most. (Manley, 2018).

As for research question two, I combined phase one and phase two's replies, all but two participants stated "yes" board games are a useful tool for practicing English Skills. Students perceived that the gaming experience was useful (Manley, 2018). For example, one student stated "I do think board games are useful for practicing English skills so much. If we do play board game, we can improve our English speaking skills and English listening skills at the same time. And also we can enjoy while we playing. The most important thing for English learner is enjoying I think. We must not feel boring for English learning because we cannot improve English skills if we feel it is boring."

The results and discussion below answer the third and fourth research question. The student replies are taken directly from the worksheets and the interviews. Syntactic or semantic mistakes were not addressed. Students are distinguished individually (S+#) and by group (G+#) (Manley, 2018).

Research Question 3: *Does perceived benefit correlate with student enjoyment of games?*

One of the goals of this research was to see if enjoyment relates to the students perceiving a

learning activity as beneficial. To see if there is any corroboration between student enjoyment and student perception of an activity's usefulness, I compared the results between phase two's questionnaire questions 1, 10, 11, 13. Question one asks about perceived enjoyment of the game, whereas the other three refer to perceived benefits of the game such as confidence building, motivation and the usefulness of incorporating games into the classroom. Although it is important to keep in mind that enjoyment is subjective, triangulation of the data between the students' perception on the benefit of games and enjoyment (Table 2) showed overwhelmingly positive results. The Likert-scale for phase two was scaled one to four. Of the participants that gave a four out of four to question one, all but two gave completely positive responses to questionnaire questions 10, 11 and 13. Of those who gave three out of four to question one, only two gave mixed negative responses to questions 10, 11 and 13. This seems to show that there may be a relationship between student enjoyment and the benefits or usefulness the game provides. This supports Krashen and Terrell's (1992) expansion of the *Affective Filter Hypothesis* (p. 38), which proposes that when learners have a low filter, they are more susceptible to the input they receive from the tasks they are doing. Hall (2011) gives examples of the types of attitudes that affect the students' filter level. For example, when learners are "de-motivated, bored, anxious, or low on self-confidence" (p.107) they have a high filter and may not acquire input, whereas the students who are "motivated, confident and relaxed" (p. 107) have a low filter and will be receptive to comprehensible input. When students are enjoying a game's task their affective filter is lowered and their confidence and motivation can increase. This is because the tasks in games can increase student motivation (Julkunen, 2001; Shih, J., Shih, B., & Chen 2006), self-confidence, and provide a stress free environment (McGonigal, 2011).

The following table shows the triangulation between the quantitative data from the Likert-scale in question one, with the qualitative data from the open-ended questions 10, 11, and 13. The coding for Table 2 is as follows: positive responses to the questions, such as 'yes', 'it helped me', 'it was useful' were given a (+) sign. If the responses were negative, such as 'no', 'I don't think so', and 'it was not' were given a (-).

Table 2

Participant Number	Likert Scale	Q10	Q11	Q13
G1S1	3	+	+	+
G1S2	4	+	+	+
G1S4	4	+	+	+
G1S3	4	+	+	+
G2S2	3	+	+	+
G2S3	4	+	+	+
G2S4	4	+	+	+
G2S1	3	-	+	+
G3S3	3	+	+	+
G3S1	4	+	+	+
G3S2	4	+	+	+
G3S4	4	+	+	+
G4S4	3	-	+	+
G4S3	4	+	+	+
G4S2	4	+	-	+
G4S1	4	+	+	+

(continued)

Participant Number	Likert Scale	Q10	Q11	Q13
G5S1	4	+	+	+
G5S4	4	+	+	+
G5S3	4	+	+	-
G5S2	4	+	+	+

The responses to the Likert-scale were above average, showing that regardless of whether a positive or negative comment was written, the overall perception was that the game was enjoyable.

Research Question 4: *According to student perception, does having a goal or task motivate students to play games and build confidence?*

Some researchers state that games provide motivation for learners and can "boost confidence and self-esteem" (Lee, 2012, p. 5), however I wanted to investigate students' perception of whether the goals in games provide motivation and built confidence. The responses to question 11 and 12 of phase two's questionnaire explored aspects of TBL by asking the participants if the tasks and goals *Forbidden Island* provided were motivating. This was done to ascertain if *Forbidden Island* met McGrath's (2002) requirements for an activity to be considered useful as a language developing tool. One of McGrath's primary requirements was motivation. Motivation in this case refers to Nunan's (1999) definition, where he states that it is a fusion of effort, "desire to achieve the goal of learning the language," (p. 232) and the "satisfaction experienced" (p. 233) when a goal is reached. The majority of the participants stated that having a task or goal helped motivate them to want to play as well as gave them confidence, especially when they won the game.

As shown in the results (Table 3 & 4), having a task or goal does motivate the participants to be involved in playing the game. For example, G1S3 stated that by having a goal in the game, they had a purpose they wanted to accomplish.

Table 3

> **Phase two Questionnaire #11: "Does having a task or goal help motivate you to want to play?"**
>
> G1S3: Yes. Having goal is motivate me to want to play. When we set goal, we have purpose. So if I have purpose, I want to accomplish.
>
> **Phase two Questionnaire #12: "Does completing a task or goal give you confidence and motivation?"**
>
> G1S3: Yes, completing goal give me motivation. But at the same time, I think I have to study English more. Because I had many times that I couldn't express my opinion in English. So completing goal gives me motivation that I have to study English more.
>
> G3S4: I think ,,,yes it does! Because when I get all treasures and win the game, I felt sense of accomplishment. And I compared me before the game and after the game. Imagine before the game, I worried about I can say my idea or remember and understand the rules. But after the game, I could say my idea and win the game, give me confidence.

Table 4

Total Phase two Responses	Yes	No
#11: Does having a task or goal help motivate you to want to play?	19	1
#12: Does completing a task or goal give you confidence and motivation?	19	1

As seen from the results for questions 11 and 12, students seem motivated when playing *Forbidden Island* and through this they believed their language skills increased (Table 1) and that their confidence also grew (Table 3). The participants also stated that they felt relaxed and comfortable talking to each other (Manley, 2018) as well as stating that the game provided a context where they not only enjoyed the activity, but also improved their English skills at the same time (Manley, 2018). The results from the study show that playing a collaborative game like *Forbidden Island*, could provide players with a low affective filter, which allows them to be more accepting of comprehensible input enabling more learning to take place.

3.5 Limitations/Problems

One potential limitation was that participants in phase one were volunteers. However, the participants in phase two were not, and they knew that they would be given a grade for their participation and work. This could have an effect on the results of the questionnaire. In addition, phase one's group had a mixed level of students because phase one asked for paid volunteers with no exclusion criteria other than never having played *Forbidden Island* and being freshmen. Because of this limitation of phase one, it seemed better to use a larger sample size of participants that were all at the same level in phase two. If all of the participants were at the same level there was the possibility that they could assist and influence each other. The participants in phase two were all taken from the same Freshman English class that I taught. This group of students had all been placed in the same level based on the tier criteria administered by Kanda University of International Studies, which takes into account the students' scores on the TOEIC and KAP (Kanda Assessment Program) speaking test.

Lastly, data was only collected from Japanese participants. Therefore the answers to the questions are based solely on Japanese students' perspectives. Even though the results might not reflect across all cultures, this study could have the potential to be a basis for future research.

4. Conclusion

This paper investigated students view on the collaborative board game, *Forbidden Island,* as a useful device for fostering communicative language abilities. However, it is not only in the communicative aspect that games assist in language acquisition and practice. Games can foster learning when they generate an environment that encourages motivation (Julkunen, 2001) while at the same time lowering stress. These factors are important to creating a low filter for students, which fosters language acquisition (Krashen & Terrell, 1992). From the results, students from both phases perceived *Forbidden Island* as a useful device for increasing their communicative skills, mainly speaking. This illustrates that a collaborative game that incorporates aspects of TBL has the possibility to be a useful communicative language device.

The research also investigated student perception on whether *Forbidden Island* could be a game that motivated and provided confidence to students. The triangulation of the responses from the Likert-scale to the comments appended to the open-ended questions showed that students believed that confidence and motivation were fostered from *Forbidden Island's* innate goals. Extending this idea shows that collaborative games have the potential to be used as an aid in a classroom setting by giving students who might be nervous or shy the opportunity to express themselves in a safe and nonthreatening environment (McGonigal, 2011). The results from this study make a useful addition to the research currently available because it combats the notion that games are only useful as a reward or an activity for down time in class (Krashen & Terrell, 1992).

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Appendix A

Forbidden Island After Game Questions

Directions: After watching your recording, please answer the questions below. Please write at least 5 sentences for each question (if possible).

    1. What kind of board games have you played before?

    0. Have you played Forbidden Island before?

    0. What kind of games have you played in your learning, both language and general education (math, science, history, etc…)?

       . Language:

        _____

        _____

        _____

        _____

      b. General:

        _____

        _____

        _____

        _____

    0. Do you think your communication skills in one of the four areas below increased while playing the game?

          i.   Reading

         ii.   Listening

       iii.   Speaking

       iv.   Other

Why do you think so?

0. What language skills do you think you need to win the game? Why?

0. What language skills do you think you need to collaborate better with other players? Why?

0. Did you feel you had enough opportunities to say what you wanted? Or not enough? Please explain.

0. How did your group members react to your suggestions and opinions?

        . Did they agree or disagree with you?

        b. How did you feel about their reaction to your suggestions and opinion?

0. Out of all the problems you faced today, what was the most difficult?

        . How did you solve it?

0. Forbidden Island is an explicitly collaborative game. What do you think you learnt from playing this with other players?

0. What was difficult about learning to play the game for the first time?

0. After this gaming session how do you feel about group work? Do you think your group members were helpful? Or did they make the game difficult to play or unenjoyable?

Objective: What will you do to prepare for the next game? What communication skills or actions do you want to focus on?

Appendix B

Researcher and Student Interview

1. Do you like playing board games? Why?

    a. Overall, what are you feelings and thoughts about the board game *Forbidden Island*?

    b. Do you think this game helped you improve your English language skills? Why? In what way?

2. Did you feel you had enough opportunities to say what you wanted? Or not enough? Please explain.

3. Do you think you participated enough in the game?

    a. Did you explain things to others? How much (more or less in comparison to other players)? Can you give an example?

    b. Did you give ideas to others? How much (more or less in comparison to other players)? Can you give an example?

    c. Did you respond to explanations from others (more or less in comparison to other players)? Can you give an example?

    d. Did you respond to others' ideas? How much (more or less in comparison to other players)? Can you give an example?

4. Take a look at this table: rank 1-3 (1 being the first choice). Which resource helped you understand the game? You can pick more than one. Give reasons for your choice(s).

Check box	Choices
	Reading the explanations in the game (ex. event cards)
	Discussing, negotiating, and speaking with other team members.
	Listening to other team members.

0.   The choices above related to different language skills.

    a. Reading

    b. Listening

    c. Speaking

    d. Other

Which one do you think you improved the most? Why do you think so?

6. Before the game, did you like to work in groups?

    a.   During the game, how did you feel about working with others?

    b.   In what ways was playing the game with others helpful to you?

    c.   After this game, has your opinion about working in groups changed?

0.   Do you think board games are useful for practicing English skills? Why?

0.   Would you like to have board games in your class?

Appendix C

Forbidden Island After Game Questions

Directions: After watching your recording, please answer the questions below. Please write at least 5 sentences for each question (if possible).

1. Do you like playing board games where you have to collaborate with other players? Why?

. On a scale of 1 to 4, where 4 is the highest and 1 is the lowest, how much did you enjoy playing *Forbidden Island*?

$$1 \quad 2 \quad 3 \quad 4$$

0. Do you think your communication skills in one of the four areas below increased while playing the game?

. Reading

a. Listening

b. Speaking

c. Other

Why do you think so? Please provide at least 2 examples and explain.

0. Look at this table: order the items from 1-3 (1 being the first choice). Which resource helped you understand the game the most?

Check box	Choices
	Reading the explanations in the game (ex. event cards)
	Discussing, negotiating, and speaking with other team members.

	Listening to other team members.

Give reasons for your choice(s)

0. How did your group members react to your suggestions and opinions, did they agree or disagree with you? Please give at least 2 examples and explain.

a. How did you feel about their reaction to your suggestions and opinion in the 2 examples you provided above?

From your first example choose from the list below which you felt when you gave your suggestion:	From your second example choose from the list below which you felt when you gave your suggestion:
. There was an agreement a. There was a disagreement b. Other: In my reaction to their response I felt: I think that the best way to respond would have been to:	. There was an agreement a. There was a disagreement b. Other: In my reaction to their response I felt: I think that the best way to respond would have been to:

0. Did you feel you had enough opportunities to say what you wanted? Or not enough? Please explain.

0. Out of all the problems you faced today in the game or with other players, what was the most difficult?

     . How did you solve it?

0. What was difficult about learning to play the game for the first time?

0. Before the game, did you like to work in groups?

     . During the game, how did you feel about working with others?

     b. In what ways was playing the game with others helpful to you?

     c. After this game, has your opinion about working in groups changed?

0. What language skills do you think you need in order to collaborate better with other players? Why?

10. Do you think board games are useful for practicing English skills? Which skills do you think you practice? Why?

11. Does having a task or goal help motivate you to want to play?

12. Does completing a task or goal give you confidence and motivation?

13. Would you like to play board games in your class? Why?

Patterns of English Usage in Manga: A pilot study

日本動漫中英語的使用模式：前導研究

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Abstract

Manga, or Japanese comics, are one of the primary forms of entertainment in Japan that cater to readers of all ages and interests. This paper is a corpus linguistics study that explores the usage of English within mainstream manga which is designed and marketed towards four different audiences: *shoujo* (female 12-18 years old), *shounen* (male 12-18 years old), *jousei* (female 18-30 years old) and *seinen* (male 18-30 years old). The corpus is made up of 12 chapters of manga, three from each of the four audience groups above. The findings show that the way English is used in manga is affected by the sex and age of the intended audience. Manga marketed towards the different audience demographics shows gendered patterns with respect to the number of tokens used, the frequencies with which they appear, their location within the manga's text and art, as well as the orthographies in which they are written. Further analysis of these patterns shows that the different uses of English adhere to commonly held cultural beliefs and serve to reinforce various gender stereotypes.

Keywords: Manga, English, Gender, Corpus, Orthography

1. Introduction

In the last century, English has spread across the globe as a lingua franca used in business, education, and everyday communication. During its spread it has influenced the languages and cultures that it has come into contact with, creating an alternate linguistic resource for people to use. An excellent example of this has been its effect on the Japanese language and culture. While Japanese grammar has remained essentially unaltered by the influx of English, "Loanwords comprise nearly 10% of Japanese language in current use and most of these loanwords are from English" (MacGreggor, 2003, p. 18).　In fact, 94% of current loanwords in Japan have come from English (Sase, 2009, p. 1) and most of them have come into the language since 1945 (Koscielecki, 2006, p. 26).

It is not only in loanwords that English has affected Japanese. Even such linguistic conventions as direction of writing can carry connotative meaning in Japan. Choosing to use English provides alternative ways for Japanese people to express themselves. The use of English by Japanese people has been examined in various mass media contexts such as women's fashion magazines (Sase, 2009), newspapers and technical journals (Smith, 1974), and Internet webpages (Murata, 2007). However, most of this research has focused on the linguistic form of the borrowings, such as phonological and semantic shifts, while only a small amount of research focuses on the actual functions that English usage fulfills in Japan (Kay, 1995).

This paper focuses on the functions of English in the Japanese mass media of manga by examining it from a gender perspective. Even today there is a large difference in the way Japanese men and women speak their language, even to the point of there being sex specific first- and second-person referents (Inoue, 2004). It seems interesting to wonder if the difference between male and female registers is carried over into the use of English as well, yet this issue seems to be explored academically only as a sidenote, for example in Sase (2009) where she says that "Englishisms appear with equal frequency in texts targeting women and men, and that while they occur in texts targeting all age groups, the frequency of Englishisms is highest in advertising intended for teenagers and

young adults" (p. 6). By studying manga, which is clearly marketed towards different sex and age groups, this paper hopes to elucidate what patterns of English use, if any, are influenced by sex in the mass media market.

2. Conceptual Framework

Manga is a form of visual entertainment in Japan that is similar to comics in that it consists of stylized pictures along with text bubbles. It is published serially within magazine anthologies of 4-26 chapters, each of which is the newest installment of a particular series (Schodt, 1996). Mainstream manga is published for four different categories of audience demographics (Gravett, 2004). These are shoujo manga, intended for the female 12-18 audience, shounen manga intended for the 12-18 male audience, jousei manga intended for the female 18-30 audience, and seinen manga intended for the male 18-30 audience.

I have chosen to examine the use of English in Japanese manga because "sales of manga dominate the publishing market in Japan" (Allen & Ingulsrud, 2005, p. 265). Shonen Jump, which is only one manga magazine out of hundreds, is read by twenty percent of the Japanese population each week (Bouissou, 2010). This is an astonishing number that has no parallel with any western publication. I believe it is important to examine such publications because "the texts [people] read…also shape part of the readers personal identities" (Allen & Ingulsrud, 2005, p. 266) and that "print and other media have the power to establish ideas about what constitutes desired femininity and masculinity with respect to personality traits, behaviors, and so on" (Okamoto & Shibamoto-Smith, 2004, p. 11). Manga is a medium that is read by a huge portion of the Japanese population and is caught up in a reciprocal relationship with the culture in which it is embedded. Manga is a mirror of popular culture (Ito, 2005; Kinsella, 2000) and yet it is also a resource for its readers to know what is acceptable behavior. By studying how English is used in manga, I hope to shed light on attitudes towards English use that are commonly held by different age and sex groups in Japan, or at the very least shed light on attitudes that those who create manga believe different age and sex groups have

towards English.

English has had an enormous impact on Japanese since 1945 as thousands of English lexical items have been incorporated into the spoken and written language (Koscielecki, 2006). English can be seen in almost every facet of Japanese life but is especially "prevalent in the Japanese mass media and advertising industry" (Sase, 2009, p. 2). Most new English loanwords first appear in the mass media (Daulton, 2004), where they are initially seen but not understood by readers. Oddly enough, understanding a new English term is not actually necessary. "The precise-meaning-bearing potential of words is often sacrificed for psychological effects that depend on the novelty and obscurity of lexical items" (Daulton, 2004, p. 219). The other aspect that is important, especially in the advertising industry, is visual appeal. Often English words are incorporated, not because of their meaning or their novelty, but because they look attractive. "Within this context the existence of an ornamental English in Japan can be seen not as the ignorant or willful misuse of the original language, but rather a strategy of using the language as an expressive tool which need not be dominated by the strictures of core semantic meanings" (Seargeant, 2005, p. 316).

Kay (1995) posits that when English words are used in Japanese they fulfill one or more of several functions. The first function of English is to fill a lexical gap in Japanese; this is generally used for concepts that had no place in Japan before it began to have Western influence. A prime example of this is the loanword プライバシー (puraibashi—) 'privacy', which has no translation equivalent in Japanese. A second function of English in Japanese is related to the first function; since loanwords originally filled in a lexical gap to describe Western concepts, all loanwords came to be associated with Western society. Thus, English loanwords are associated with a sophisticated and modern lifestyle and are used in place of native words because of these positive connotations. A third function of loanwords is to serve as eye-catching devices; because they are presented either in their native script or in the specialized katakana script, they serve to break up the text and focus attention on certain areas. Finally, English loanwords also serve as euphemisms for uncomfortable subjects or taboo topics in Japanese.

Regardless of the intended function, all English loanwords undergo various changes in their phonology, structure, and semantics when incorporated into Japanese. Japanese is a language that does not allow any consonant clusters, nor any syllable ending consonants other than [n]. Therefore, when an English word is adopted that contains either of these structures, Japanese inserts vowels between the consonants that make up the cluster or after the syllable final consonant (Olah, 2007). Thus, the word 'black' changes to 'buraku' and inserts a [u] after the initial [b] to break up the initial consonant cluster and adds another [u] at the end of the word in order to avoid the word final [k]. Also, Japanese lacks many of the phonemes that English has and so the pronunciation changes in order to match the closest Japanese phoneme. [th] changes to [s] and [v] changes to [b] among others. Finally, Japanese does not distinguish between [r] and [l], instead it only uses [r].

The insertion of vowels to fit Japanese moraic structure leads to English loanwords becoming quite long. Take the English brand name 'McDonalds', in English it has three syllables, however, when it is adopted into Japanese it is マクドナルド (Makudonarudo) and has six syllables. This gets time-consuming for Japanese speakers and so they resort to structural change and truncate the word to form マク(Maku) (Olah, 2007). An especially productive strategy that Japanese speakers apply to enormously long English loanwords is a process called 'backclipping' where they chop off the ends of words (Kay, 1995). An example of this is the term アクセル (akuseru) which was created by chopping off the end of 'accelerator'.

Another productive strategy for structural change in the Japanese adaptation of English loanwords is the changing of parts of speech. Japanese has a system of adding suffixes to mark adjectives and verbs. Any word can be adopted into Japanese and if the suffix 'na' is added, then it is an adjective, and if the verb 'suru' is added as a suffix then it changes the loan word into a verb (Koscielecki, 2006). Thus, for instance, you can have テニスする (tenisu-suru) which would be translated as 'tennis-ing' or 'to do tennis'.

The final type of change that occurs when English words are borrowed into Japanese is semantic change. Of course, this happens in almost every instance of borrowing no matter the languages

involved. "Borrowed words inevitably acquire culture-specific meanings, to varying degrees" (Kay, 1995, p. 71). In Japanese, however, a speaker of English should never assume that they can figure out the meaning of a Japanized English word based on the original English meaning. For instance, the word 'fight' has been borrowed into Japanese as ファイト (faito), however it has little meaning associated with confrontation or coming to blows, instead it has come to mean 'do your best' or 'don't give up'. Finally, while some borrowed words are closer to their original English meanings, they have become so specialized as to only denote a fraction of their original meanings. For example, バッグ (baggu) from 'bag' only refers to ladies' handbags and not to grocery bags, school bags, or any other type of bag.

3. Methodology

In this paper I will be studying how English is used in manga that targets different age and sex groups. As there are hundreds of manga magazines being published each month, I chose to examine a corpus selected from the magazines that reach the largest audience in each of the four categories mentioned above. For the *shoujo* category this is the magazine *Ribon*, for the *shounen* category it is the magazine *Shounen Jump*, for the *jousei* category it is the magazine *You,* and for the *seinen* category it is the magazine *Young Jump*. All of the magazines were published in July 2011 and I took a random sample of three chapters from each and counted all instances of English usage contained within.

In order to ascertain what is an English token, I will be using an approach I based on content analysis which "offers a way to systematically organize and summarize both the manifest and latent content of communication" (Light & Keller as quoted by Ito, 2004, p. 83). I will organize all English contained inside of the corpus into five content categories. The main feature used in this coding process is orthography. Japan is a highly literate nation that makes use of four different writing systems in everyday life. Two of these scripts, *katakana* and *romaji* (the Roman alphabet), are used almost exclusively for foreign words. This makes it quite easy to determine which words are not

Japanese in origin (Tamaoka & Miyaoka, 2003). For a token to be included in this research it first had to be written in either the Roman alphabet or in the *katakana* script.

Because of this aspect I have split my findings into five categories depending on the origin language and which orthography is used to write the token. The first group is native Japanese words that are written in the Roman alphabet. For example the Japanese word 山 (mountain) is written as 'yama' in the text following its phonetic realization rather than being written in any of the native Japanese orthographies. I am including these types of tokens because the script choice is important in and of itself and fulfills various functions in Japanese manga. When a native Japanese word is written in the Roman alphabet, it is done for a specific reason and carries meaning. The types of functions it performs will be explored in more detail below.

The second group is a native English word that is written in the Roman alphabet. This is very common in manga titles, for example the names of many famous series, such as: *Bleach, Sailor Moon, Dragonball Z,* and *One Piece.*

The third group is a native English abbreviation that is written in the Roman alphabet. In abbreviations I included all acronyms and all abbreviations. This included things like 'PBJ' as well as tokens like 'no.' and 'vs.'.

The fourth group was made up of a native English word that is written in the Japanese *katakana*. For example, the word ダンス (dansu) for 'dance'.

The final group was made up of a native English word or words that had been abbreviated when borrowed into Japanese. This means that these terms do not follow the rules of English abbreviation but of Japanese. Each word that is abbreviated is counted as one token, therefore even if a token is presented as one word in Japanese, if it was originally made of two words in English it is counted as two tokens. For example, アニメ (anime), which is an abbreviation of the word animation, is counted as one token. The word ロリコン (lolicon), on the other hand, is counted as two tokens because it is made up of the abbreviations of two English words 'Lolita' and 'complex'.

After finding and coding each English token into one of the categories mentioned above, I will

use frequency counts to analyze the trends and patterns of each type and how it is used in manga. This will include analyzing the location of the English used, whether it is produced by the characters of the manga, used in the background image, or if used in the advertising contained within the manga itself. Examining all of the patterns will allow me to form inferences about the functions that English performs in manga targeting different age and sex groups and will also allow me to form inferences about the consequences or effects that these patterns will have on readers.

4. Discussion & Results

Figure 1

Total Number of English Loanwords in Japanese
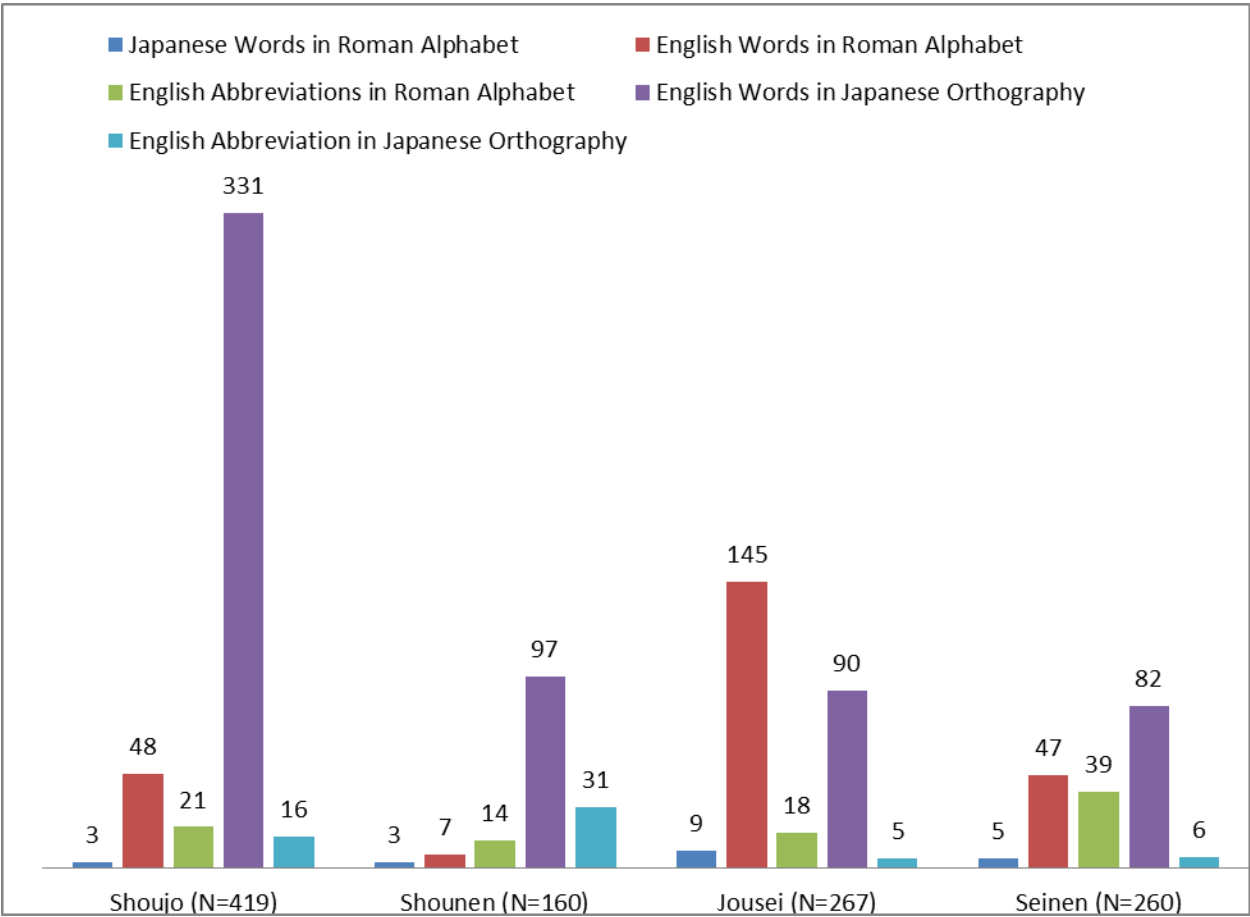
The first thing of note in figure 1 is that shoujo manga, intended for the 12-18 female audience, has significantly more English loanwords than the other categories of manga with 419 total tokens.

The next interesting thing is that there is a larger difference between the numbers of English loanwords in the manga intended for the younger audience than in manga intended for the older audience; where shoujo and shounen manga differ by 259 tokens, jousei and seinen manga differ by only 7.

Even though Sase (2009) claimed that Englishisms were to be found at a higher rate in media intended for a teenage and young adult audience, this does not actually seem to be the case in manga. According to a simple count of tokens, it seems that Englishisms are most popular among young teenage girls and least popular among young teenage boys as English appears with 419 tokens in manga targeting girls and 160 tokens in manga targeting boys with manga targeting adults having between 260-267 tokens.

The other interesting thing that can be noticed in the figure above is that the single most common type of English loanword in Japanese is the type where the words that have been adapted to the Japanese structural system and have been written in the katakana script. This type of English borrowing is overwhelmingly favored in all manga categories except in the manga for adult women where English words written in the Roman alphabet have the clear majority.

This is particularly of note because although all the manga magazines contain English loanwords in the titles of the magazines, only the magazine for adult women is an English word written in the Roman alphabet, You. It seems that writing English in the Roman alphabet is appealing to adult women in Japan. This could be the case for several reasons. It could be because English connotes modernity and sophistication; it could be an extension of the Japanese stereotype that men are good at math while women are good at language; it could even be that English is a neutralizing force in male and female communications and by using the second-person referent 'You' in English, the entire mess of gender-specific second-person referents in Japanese is cleverly avoided.

Figure 2

Reiteration of an English Loanword in Multiple Orthographies
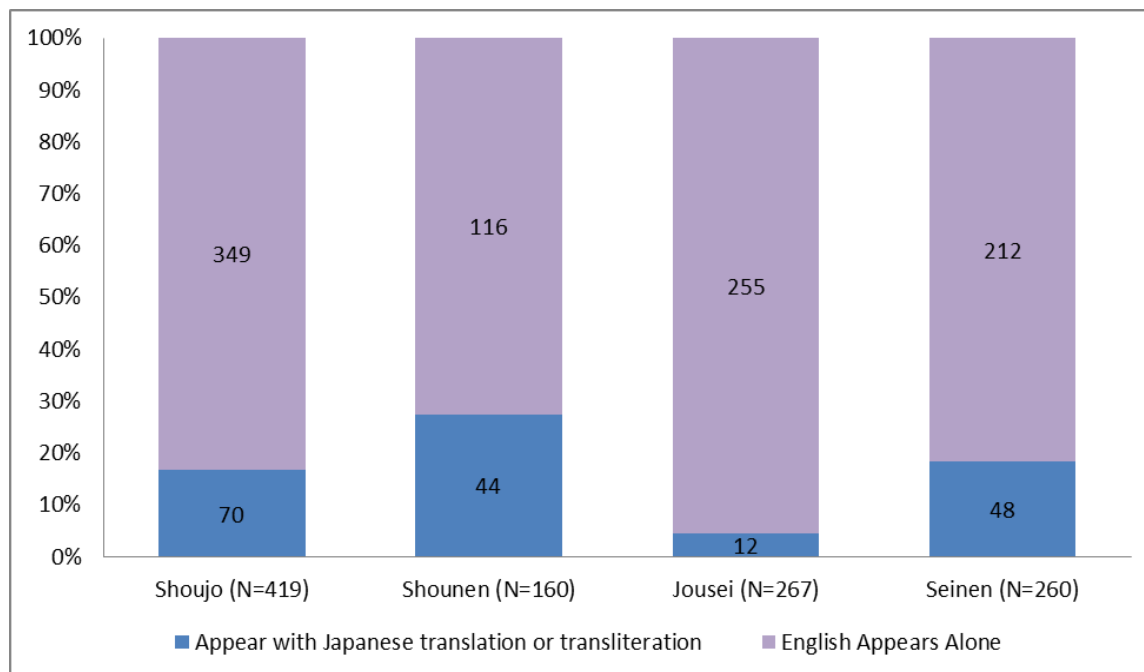
Although some of the research into English loanwords in a Japanese context suggested that "English and Japanese are used together to make it easy for readers of Japanese to understand" (MacGreggor, 2003, p. 21); this does not seem to be borne out in manga where less than 30% of all tokens are written in both English and Japanese orthographies. What is interesting in this data is that the jousei manga category is quite different than the other categories, with only 12 instances out of 267 where a loanword was written with a Japanese translation or transliteration. This seems to suggest that it is expected for adult women to have a higher English proficiency than either young readers or adult male readers, and therefore they do not need the extra help that a translation or transliteration gives. It is reasonable that they would have a higher English proficiency than 12-18 males and females, as adult women would have already completed their English instruction in secondary school and college, while the 12-18 year olds are just embarking on their study of English. However, this cannot explain why there is less translation and transliteration in the jousei category than in the seinen category. Both the men and the women of this age group will have finished their English education, so theoretically they would have equal access to English. For some reason, perhaps because of the stereotype mentioned above, it seems that women readers are just expected to be more proficient in

English than men.

The pattern of female magazines using more English gains further support when we notice that although the shounen category contains the fewest tokens of English use across all the categories, it also has the highest rate of translation/transliteration in all of the categories with it reaching almost 30%. This serves to highlight the assumption that teenage boys might not know much English and therefore need the extra help provided by these in-text translations.
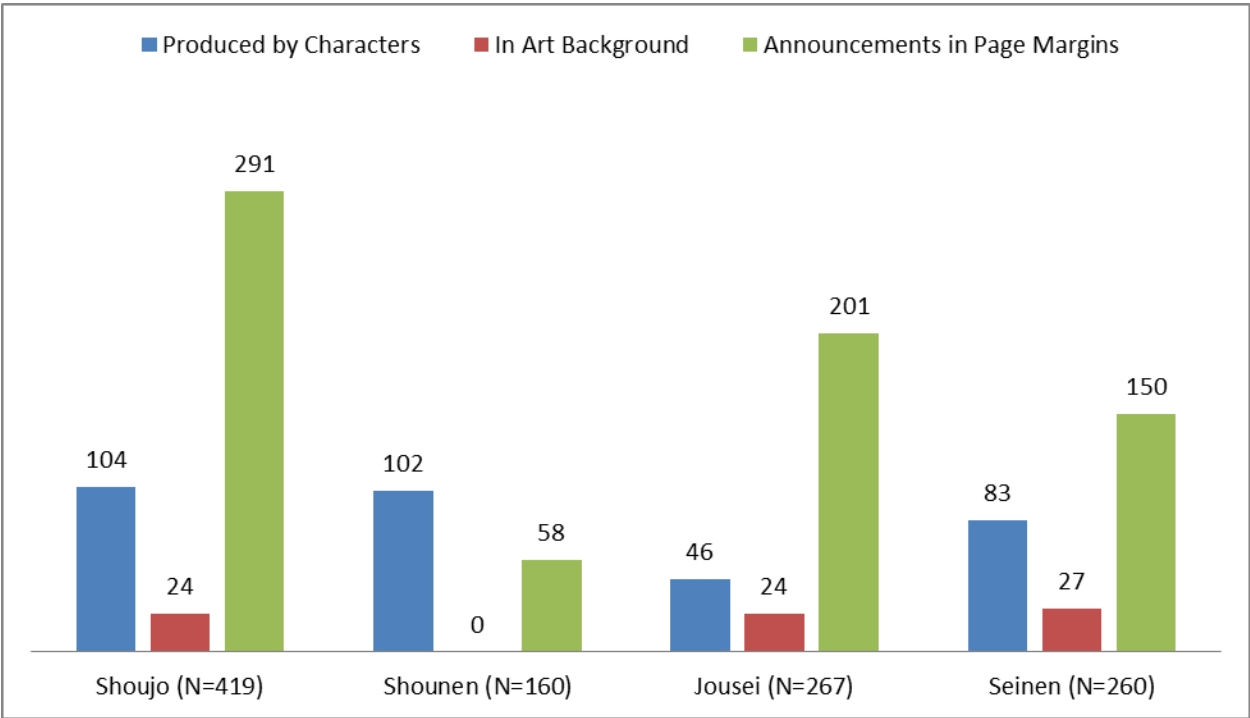
Figure 3

Distribution of English Usage by Male and Female Characters
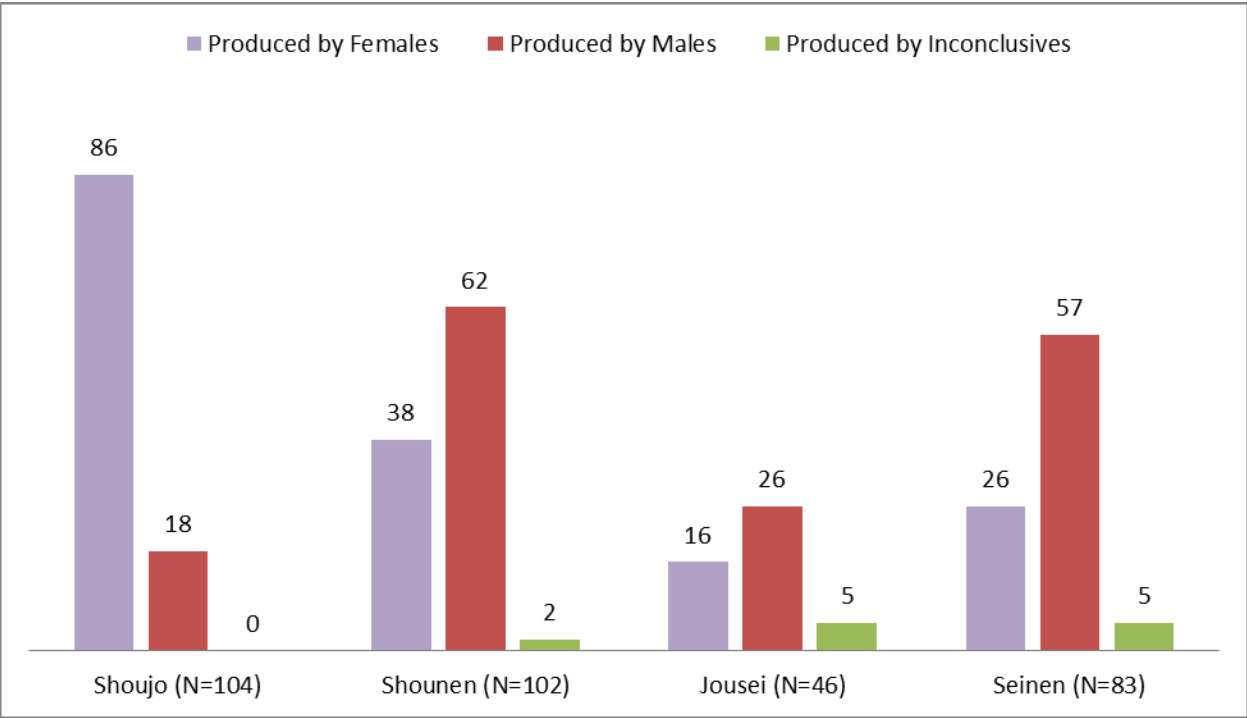
What can be seen from figure 3 is that male characters in manga produce more English words than do females in all categories of manga except for shoujo manga. However, this does not necessarily mean much as it closely mirrors the findings for overall amount of speech produced by character that was discussed in my thesis, Gender Portrayal in Japanese Manga ([name deleted to maintain the integrity of the review process], 2012). There I found that more speech is produced by

male characters than by female characters in all categories of manga other than shoujo. With more

male characters producing speech than female characters, it would follow that they would use more

English as they would have more chances to do so.

Figure 4

Location of English Loanwords

As can be seen in Figure 4, English was not only being used by the characters, but it was also

used in the background art of the story and in the margins surrounding each page. In fact, in every

category, except shounen, there was more English in the margins of the pages than in the manga itself.

In shoujo manga, most of the English comes from the repetition of the title of the series. The author

of a particular series will often write a letter to their fans in the margin of the story talking about their

life, their favorite character, or some such information. These letters to the audience are usually quite

long and are written in an intimate dialogue sort of fashion. In the margins of the manga the readers

are encouraged to be involved with the author of the series by writing a postcard to the author,

submitting drawings of their favorite characters, and by joining various lotteries to win special series-

related goods.

In jousei manga as well, the author will give little tidbits of information about their characters and story line, perhaps waxing eloquent on how they came up with the design of a particular character. However, most of the English in the manga comes from the repetition of the series title in the margins and the repetition of the magazine's slogan 'comic for your life YOU'. This slogan appears on nearly every page of the magazine, and on the pages it does not, the title of the series does.

In seinen manga, most of the English in the margins comes from the repetition of the magazine title Young Jump that appears both in the Roman alphabet and in the Japanese katakana. The rest of the English comes from the magazine encouraging the readers to catch more of the magazine's manga on the internet. In this instance, it is not an invitation to a specific series but more of a general invitation.

Shounen manga is the interesting outlier in this pattern as it not only does not have any English in the background art of the story, but it also has more English being spoken than appearing in the margins. It is interesting that there were no instances of English in the background art of the story. At first, I thought it might be because shounen stories tend to be set in more fantastical settings where it is not likely to see store signs in English; however, this was not the case. Two of the stories were placed in modern day Japan in a school setting, similar to the backgrounds where shoujo stories are set, and yet, no English appeared in the background of the story.

The background in shoujo manga does appear to be more important than in shounen manga; the brand names of objects are often visible; signs and posters have words written on them rather than just being portrayed as blank squares. Perhaps the only reason that there is no English in the art of shounen manga is simply because the backgrounds are simpler and starker to serve to highlight the characters and their actions. In the art of shoujo manga, on the other hand, the backgrounds are lavish and detailed, and when they appear simple or lack detail it is to highlight a particularly emotional

scene or dialogue (Gravett, 2004). I am not sure if this absence of background English holds true for all shounen manga or if it is something only accidentally present in my sample, regardless, it is something that would benefit from further research into a larger selection of manga.

When English does appear in the margins of a shounen manga it is not necessarily series specific. Often it is an announcement about the comic magazine itself, announcing that one of the manga contained therein will have a color page, or just having the title of the magazine 'Shounen Jump' in the margin. Occasionally they give the reader a tidbit about the author or the upcoming installment of the series, but nothing as in depth as is present in shoujo manga.

The main function of the English that appears in the margins in all the categories seems to be to restate the name of the magazine. The main difference between the four categories is that for the male audiences, their readers are encouraged to check out more content on the net or later in the magazine, while for female audiences there seems to be a dialogue between the author and the readers and the readers are encouraged to participate much more in the creation process by asking questions or drawing their own versions of the characters. This seems to agree with Gravett's statement that:

> a shojo manga reader can grow attached to her favourite artist, more so than to a character or magazine, and follow her output devotedly…A shojo manga author will often write and draw notes in the margins of her serialized stories, for instance detailing information about her health, her holidays, her hectic schedule or how she feels about her characters. Readers are encouraged to write in with queries and suggestions, to which they may receive a response in print or by letter. This interaction forges a feeling of confidentiality and involvement, almost a sisterly bond, that can last into a reader's adulthood and throughout an author's career. (Gravett, 2004, p. 081)

Because of manga magazines' penchant for reiterating the English title of the magazine and title of the manga series in the margins of their manga, a great deal of the English that is used is repeated. For example: in one manga chapter, 'Real Clothes', the slogan 'comic for your life YOU' is repeated

seven times, the title of the magazine 'You' is repeated four times, while the title of the manga chapter itself is repeated seven times. The number of repetitions of the slogans and titles of the manga make up a hefty proportion of the English that is used. For this reason, I took each type of token and calculated what percentage of that type of token were repeated and what percentage were original terms.

Figure 5

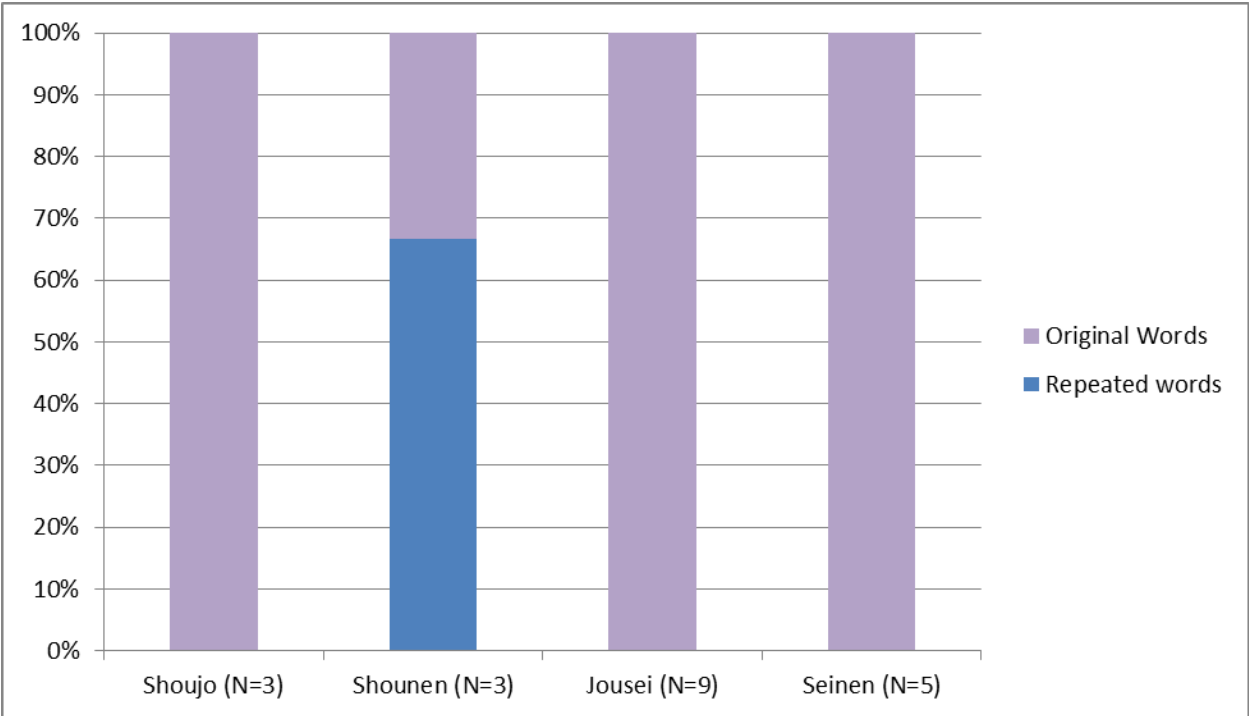Repetition of Japanese Words Written in the Roman Alphabet

Figure 5 shows that when a Japanese word is written in the Roman alphabet, it is usually an original creation. The only category that shows any repetition is shounen manga, and this is an artifact from one of the series being called 'Naruto' after the main character's name. What is interesting in the chart above is that the total numbers are very small: this seems to show that they carry a large weight of meaning. Random Japanese words are not just haphazardly written in the English alphabet, they are carefully selected and fulfill a certain role. Perhaps writing a Japanese word in English serves to highlight it in some way, to make it stand out from the rest of the words. There seem to be more Japanese words written in the Roman alphabet in the categories directed towards older audiences. In

jousei manga in particular there were several instances of Japanese authors choosing to write their names in the Roman alphabet, and to write store logos in the Roman alphabet. The use of English to write the author's name may have the function of making the artist, and by extension their work, more modern, sophisticated, and fashionable as the use of English carries all these connotations (Kay, 1995). The use of the Roman alphabet to create store logos may simply reflect Japanese culture, where:

The dominant retail types among the English-only shop names were women's clothing stores and hair salons, two industries in Japan which tend to view their foreign counterparts in western countries as superior…Using English-looking names, such as 'IMAGE,' 'Princess Kmkm,' and 'm. m' which stands for ('monkey magic') elevates the status of these shops (MacGreggor, 2003, p. 20).

Another possible explanation for the lack of repetition in this category of tokens could be that it is often the name of the author, which is itself unique, or the name of an invented store which appear in the Roman alphabet, at least in jousei manga. These two types of words are unique and idiosyncratic, and it is unlikely that they would be repeated. The author's name is usually only on the first page of the manga, and it is natural for a manga artist to include many different shops in the background of the story as it is unlikely that the entire story would take place in the same setting.
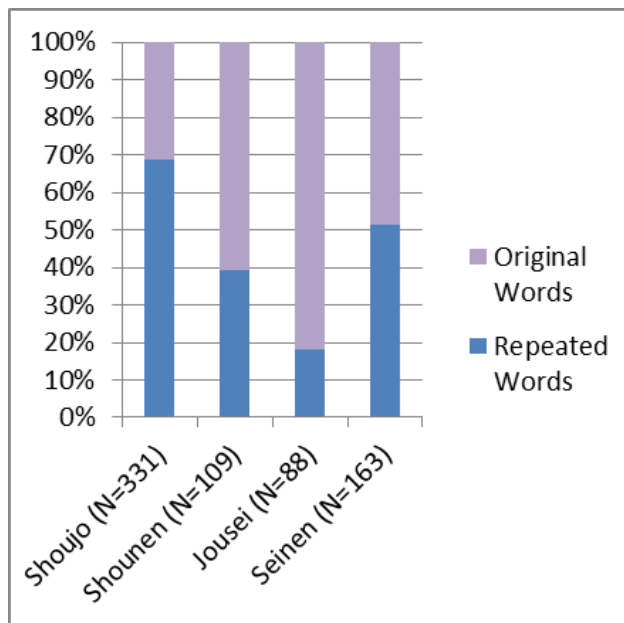
Figure 6

English Words in Roman Alphabet
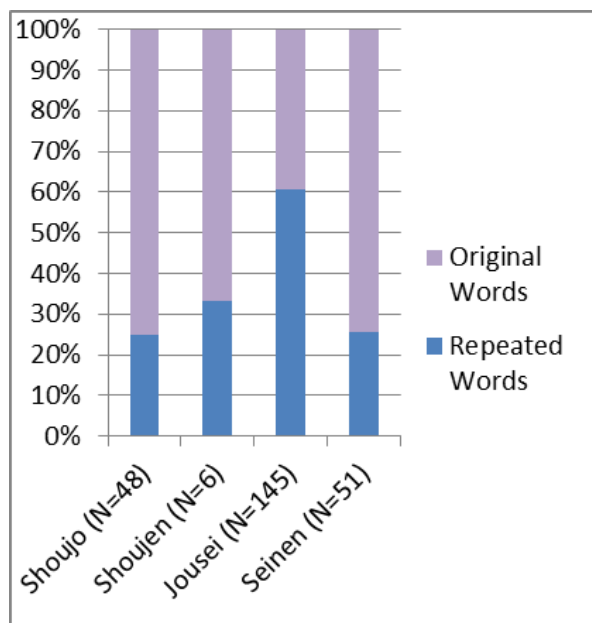
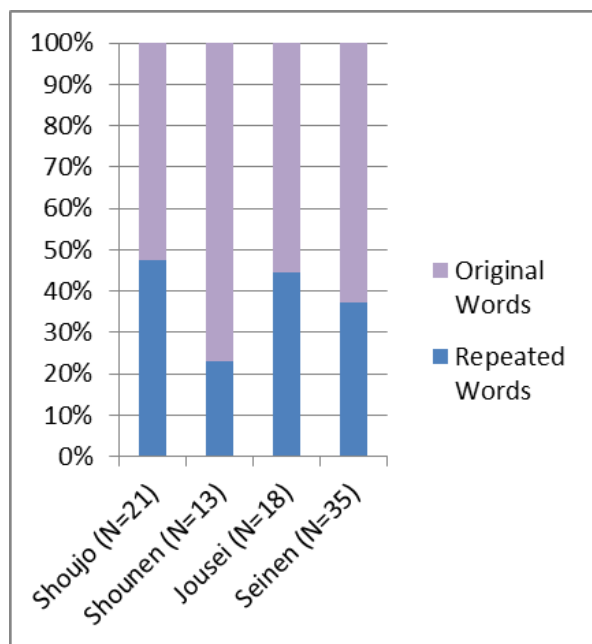**Figure 7**

English Words in Katakana

From figures 6 & 7 above a general pattern can be seen. In the categories of shoujo, shounen, and seinen manga, English words that appear in katakana are repeated more often than English words that are written in the Roman alphabet. It could be expected that terms that are written in the Roman alphabet would need to be repeated more often because it is less likely that the audience will understand them, and therefore they need to be repeated in more contexts so that the audience has a greater chance of understanding them. This does not seem to be the case at all. As mentioned earlier, English seems to be used for its novelty and positive connotations, understanding it is not actually necessary. Since novelty is lost with repetition, it makes sense that the words written in the Roman alphabet are not repeated very often.

On the other hand, the English words that are written in katakana have been incorporated into the language thoroughly enough to have undergone phonetic and orthographic change; it is more likely that the audience has had contact with these forms and understands them. They are no longer being used for their novel impact but as an accepted part of the Japanese language.
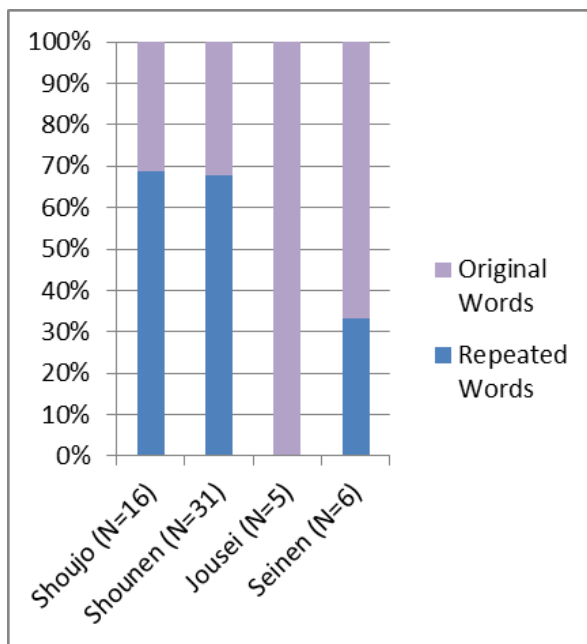
Figure 8　　　　　　　　　　　　　　　　　**Figure 9**

Roman Alphabet Abbreviations　　　　　　　　Katakana Abbreviations

The same pattern that was remarked upon comparing figures 6 & 7 seems to also hold true for comparing abbreviations written in the Roman alphabet and abbreviations written in katakana. Abbreviations that appear in the Roman alphabet are repeated less often than abbreviations that appear in katakana. Although the argument is almost the same: that the words that appear in the Roman alphabet carry more creativity, while the words that appear in katakana are more incorporated into the language, it is a bit different than the earlier argument.

Katakana abbreviations (figure 9) seem to be more incorporated into the Japanese language than those borrowings that are complete words (figure 7). This is because katakana abbreviations follow Japanese rules of abbreviation, not English rules. If I were to put the phonetic realization of these abbreviations, an English speaker would not recognize them at all. For example, there is the katakana abbreviation トレ (to re); simply hearing the word an English speaker would never guess that it was an abbreviation for 'training'. Once the origin of the word is known the abbreviation makes sense, but it is nearly impossible to go from the abbreviation to the origin word without knowing how

Japanese abbreviates words. It is unfortunate that so few katakana abbreviations occurred in jousei and seinen manga; it would be interesting to see if katakana abbreviations were repeated more often than katakana whole word borrowings. This seems to be the case for shoujo and shounen manga, however, there were not enough tokens of katakana abbreviations in the adult categories so I cannot form any hypothesis about their distribution as compared to the whole word borrowings.

5. Conclusions and Future Research Directions

In manga, it appears that male characters use more English than female characters in every category except *shoujo*. However, this seems to be simply because more male characters get to talk than girl characters in these categories, rather than male characters having a higher rate of English production. In manga for the adult audiences, English appears almost equally, while in manga for the younger audiences English appears far more frequently in manga targeted for girls. In further research, analysis should focus not only on comparing sheer amounts of English produced in manga, but also the rate at which English is produced per character. This would shed more light on any patterns or lack of patterns in gendered English production and help to further the field of study of sociolinguistics in manga.

Across the categories of manga, the sex of the audience affects the types of English used and the purposes they serve. In *shounen* and *seinen* manga it appears from the magazine encouraging the readers to explore further content either in the magazine itself or in the magazine's affiliates such as online webpages; in *shoujo* and *jousei* manga, while the magazine also encourages readers to explore further content online, more English appears in the margins where authors interact with their readers. *Jousei* manga seems to place a high value on English written in the Roman alphabet and thus has the highest rate of occurrence of this type of token.   Finally, English words and abbreviations that are written in the Roman alphabet are repeated less often than English words and abbreviations that are written in the *katakana* alphabet. This suggests that the Roman alphabet is used more for its aesthetic value in introducing novel items while *katakana* is used for borrowings that are accepted and

understood by the general populace.

An aspect of the research that deserves further examination is related to a methodological point. Although all my sources, and indeed Japanese textbooks and speakers, say that *katakana* is "the phonetic script for writing foreign words" (MacGreggor, 2003, p. 18), this does not seem to be the case. Orthography is manipulated in manga to change the meaning of the words being portrayed. *Katakana* seems to be used often to present character names, even though the character names are Japanese. When characters are called by their name in the manga their name appears in *katakana* but when there is a character sheet, their name appears in *kanji*, or ideographs.

Often the same native Japanese word is presented alternately in a *kanji* and *katakana* form. This is unexpected; *katakana* is supposedly reserved for representing foreign words. Sometimes it makes sense to present a Japanese word in *hiragana* (the Japanese phonetic orthography for native words); if it is a very difficult *kanji* that is made up of dozens of strokes, it is possible that not all readers will know how to read it and so it will be written with *hiragana* to aid in pronunciation, a convention called *rubi* or *furigana*. Even in these cases, though, *hiragana* would be chosen, not *katakana*. Nevertheless, what I found in *seinen* manga was that very simple, elementary grade level words that all Japanese people might be expected to know were written in *kanji* form when used by one character and written in *katakana* when used by another character. There is a meaning behind this as people do not switch orthographies randomly; it serves some sort of function. I do not necessarily know what functions it serves, perhaps it indicates a demonstration of the relative power between characters. Whatever the reason, it is clear that *katakana* is being used in a way that is different from how it is portrayed as being used and further research into this usage can be studied in more detail from a larger sample size in order to find out why it is occurring.

A final avenue for further research would be to tease apart the use of English in manga itself versus the use of English contained in advertisements within manga. At first glance, the fact that *shoujo* manga uses 4 times as much English as the other categories seems very significant, and it is, but is this a feature of manga targeting young girls, or a feature of marketing that targets young girls?

Further research should look at the English produced by characters and contained in the background

of the manga art itself and see if the same pattern of dominance by *shoujo* manga is repeated once the

advertisements are removed from consideration.

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十二年國教下國中生活科技教師之工作內容分析

Job Analysis of Junior High School Living Technology Teachers in the 12-Year Basic Education

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摘要

　　科技領域為十二年國教之一大重點，隨著計畫與經費的注入及教學設備環境的更新，生活科技教師的教學專業能力也將有所改變，為目前十二年國教下國中生活科技教師的工作內容帶來新的挑戰。本研究旨在探討十二年國教下國中生活科技教師的工作內容，透過半結構式訪談法，依據研究目的發展訪談問題，以確認十二年國教下國中生活科技教師的工作內容。訪談對象具備足以回答訪談問題之相關經歷，包括一位生活科技專任教師及生活科技本科出身之一位主任與一位校長，總共三位訪談對象。本研究的結果有以下三項：(1)十二年國教國中生活科技教師之教學工作包括課程的規劃與執行、評量、班級經營、教室管理及維持教學專業能力；(2)十二年國教國中生活科技教師之行政（服務）工作包括規劃生活科技教室、參與科技領域相關計畫及執行學校校務行政工作；(3)十二年國教國中生活科技教師之研究工作包含參與行動研究及教案競賽、帶隊競賽及其他能促進教學成效之研究工作。

關鍵詞：十二年國教、國中生活科技教師、工作分析

壹、前言

生活科技在九年一貫課綱隸屬於自然與生活科技領域，而不少升學導向的學校在實際教學中忽略非考科的生活科技，或是以理化課取代之（潘怡安，2021）。相對於過去被忽視的狀況，生活科技科在十二年國教中被重新規畫於科技領域，也因此各校急需科技領域教師。在新進人員尚不足的過渡期，培養生活科技教師的第二專長班也應運而生（范斯淳、陳君瑜，2021）。

為促進科技領域課程能順利推動，關於師資配套、設備需求及課程推動等皆如火如荼地進行中。例如 105 學年度成立各縣市 11 個自造教育及科技中心，目前仍持續增加；106 學年度成立科技領域中央輔導團、地方科技領域輔導團等，讓各縣市生活科技教師參與增能課程。此外，教育部自 107 年度起逐年補助各校款項，已補助了 908 間教室的基本設備及 178 間教室的擴充設備，讓各國中都能有足夠的經費，充實生活科技教室的設備以落實教學（教育部國民及學前教育署，2019）。由以上可知，目前科技領域的相關計畫豐富、經費投入也相當可觀，當這些計畫與經費注入學校時，校長、主任或組長便需要組織校內生活科技教師共同執行，也為現職生活科技教師帶來許多新的工作任務及挑戰。

在十二年國教的推動下教育部也鼓勵教師進行跨領域共備課程，以培養未來更有競爭力的下一代（古光秦、古瑞雲，2019），科技領域在課程架構中既為部定課程也是「科技資訊與媒體」核心素養中重要的一環，更是學校運用彈性課程時數發展科際整合的統整特色課程之重要內涵（賴榮飛，2017），因此他科教師將有機會與生活科技教師發展共備課程。不過在教師跨領域的共備工作上，文獻指出教師正面臨些許困境，例如待建立信任文化、教學專業自主權感覺受到侵犯（徐育婷，2018），以及不同領域的教師對課程規畫的想法相異，以致意見不合而產生摩擦（劉育瑄，2018），教師們應開始關注與他科之間的聯結（張文權等人，2019）。「信任」是學校組織中的重要元素（Gray et al., 2017），透過彼此的了瞭解來建立信任，生活科技科經過十二年國教的改革，若他科教師能對生活科技教師的實際工作內容有更正確的認識，將減少跨科教師合作間的隔閡，營造相互信任的文化。

師資培訓亦是教育改革中相當重要的一環，任何課程的變動都需要縝密的師資培育配合（鄭湧涇，2005）。目前因應十二年國教上路，各校科技領域的教師需求增加，這也確實反應

在近年來全台各縣市的教師甄試考情上，同時大學端的師資培訓也正緊鑼密鼓地進行。然而，黃政傑（2020）指出在應對課綱的變動下師資培育都是被動的狀態，在課綱訂定後才開始規劃該如何進行職前的培育，導致來不及充分滿足十二年國教新設領域或科目的需求。此外，教師甄試時又該如何選用適任的生活科技教師？若需要更加了解在十二年國教下生活科技教師的工作能力需求，便需要針對生活科技教師的工作進行分析。

綜上所述，在十二年國教下國中生活科技教師的工作內容包含哪些？或是帶給目前生活科技教師新的挑戰與難題又有哪些？過去曾有研究指出，有些生活科技教師在使用十二年國教的教室設備經費時，因首次規劃教室及對機具廠牌不熟悉，就曾發生採購錯誤或不適合該校需求的問題（陳彥綸，2020）。而林清章、陳啟東（2006）曾指出學校的教育是否能成功達到整體目標，與教師專業能力有很大的關係，所有課程都需要經過教師的詮釋和實施，課程改革的成功關鍵便是學校的每一位教師（楊智穎，2019），生活科技教師在十二年國教的推動下亦擔任著重要的角色，其實際工作內容為何值得探討。
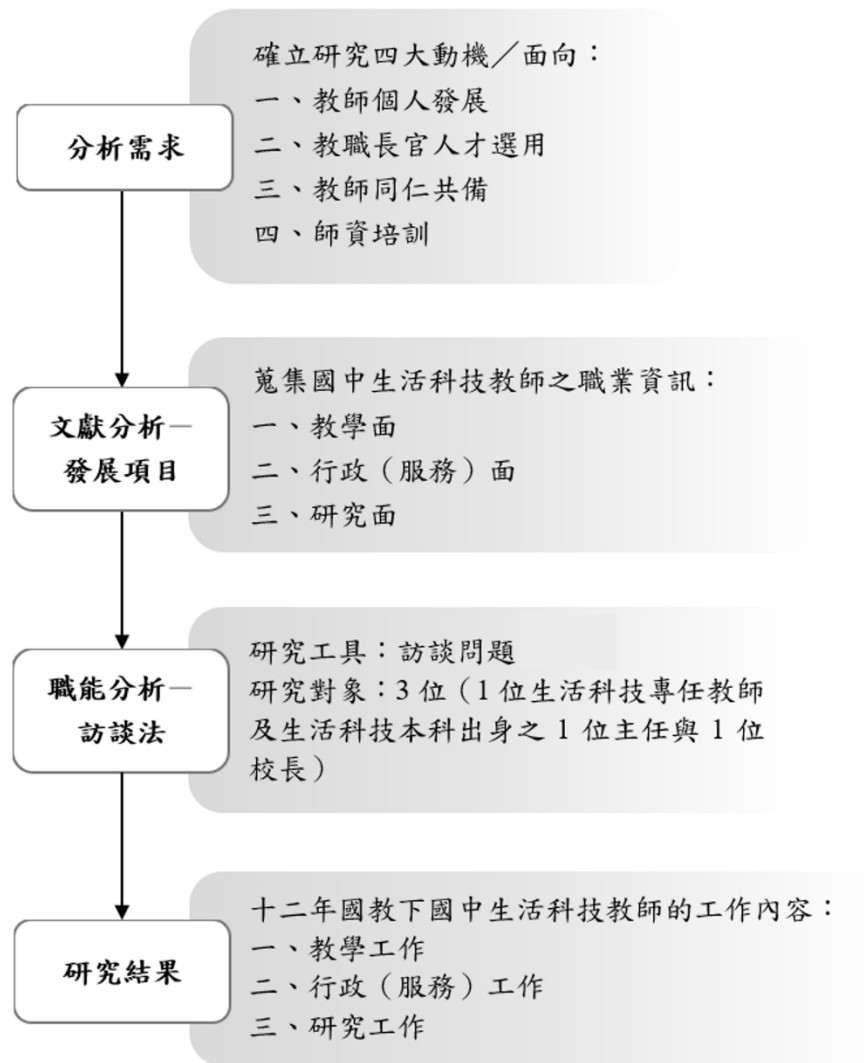
根據以上四個研究動機，本研究將探討相關文獻及透過半結構式訪談法，以進一步了解在十二年國教下，國中科技領域生活科技教師的工作內容。因此，本研究有以下三項目的：

（一）探討十二年國教國中生活科技教師之教學工作。

（二）探討十二年國教國中生活科技教師之行政（服務）工作。

（三）探討十二年國教國中生活科技教師之研究工作。

圖 1 為本研究的研究架構圖。

圖 1

研究架構圖

分析需求	確立研究四大動機／面向： 一、教師個人發展 二、教職長官人才選用 三、教師同仁共備 四、師資培訓
文獻分析—發展項目	蒐集國中生活科技教師之職業資訊： 一、教學面 二、行政（服務）面 三、研究面
職能分析—訪談法	研究工具：訪談問題 研究對象：3 位（1 位生活科技專任教師及生活科技本科出身之 1 位主任與 1 位校長）
研究結果	十二年國教下國中生活科技教師的工作內容： 一、教學工作 二、行政（服務）工作 三、研究工作

貳、國中生活科技教師的教學工作分析

　　教學工作泛指一切與指導學生相關的工作內容，其應符合十二年國教之科技領域課綱規範，且因應科技領域的成立，隨之而來的教學專業能力進修、研習課程、相關競賽與計畫等皆包含在內。
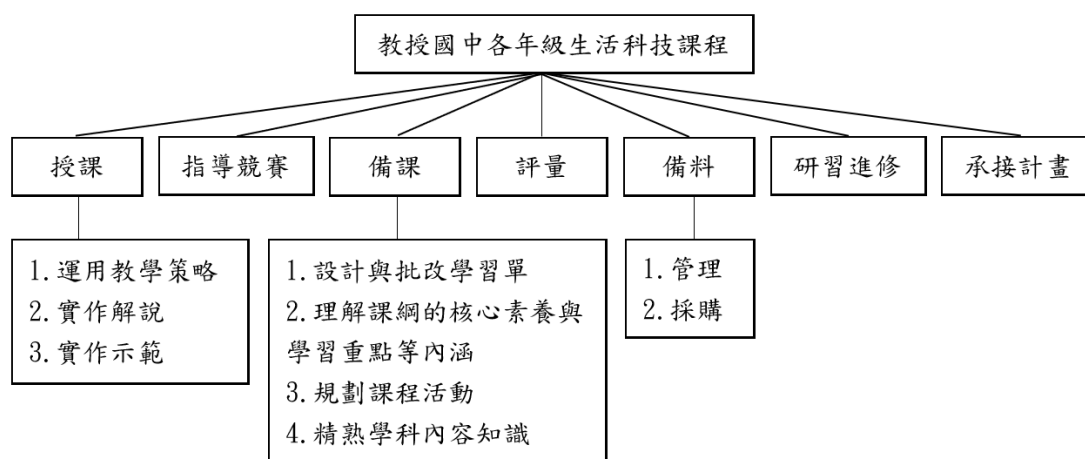
一、教授國中各年級的生活科技課程

　　自十二年國教上路以來，探討國中生活科技教師的工作內容之研究並不多，僅有少數研

究探討關於在十二年國教下國中生活科技教師應具備的教學專業能力之相關議題（李易穎，2017；陳彥綸，2020），或是探討國中生活科技教師的教師專業發展之途徑與現況（林弘昌、陳彥綸，2019），以及呂建億（2014）發表之生活科技教師實作的教學表徵研究。透過以上文獻中提及國中生活科技教師應具備的「教學專業能力」來對應「工作內容」發現，教授各年級之生活科技課程所包含的重要工作項目有七項，彙整於圖2。

圖 2

生活科技教師的重要工作項目

二、指導學生參加科技領域相關競賽

依據十二年國教及「教育部國民及學前教育署各縣市科技教育推動總體計畫」，目前有全台各縣市每年舉辦的國中生活科技競賽，若學校有意參加，將由該校的生活科技教師帶隊指導學生參與競賽，工作內容包含選手遴選、選手額外訓練及教師自我增能等。

三、參與科技領域相關之研習

依據十二年國教及「教育部國民及學前教育署補助國民中學與國民小學推動十二年國民基本教育科技領域課程作業要點」，辦理教師研習實施計畫，各校生活科技教師應參加「科技領域共備研習」及科技中心舉辦之「教師研習、科技教育種子教師培訓研習」。

四、規劃、管理及採購生活科技教室之相關設備

隨著生活科技教室設備經費的注入，當充足、新穎的機具或設備進入教室後，如何妥善

規劃擺放方式、管理教室動線與採購適用設備是一個重要的工作，因為教室的規劃與管理攸關著學生能否在生活科技教室內安全無虞的進行學習（陳彥綸，2020）。

參、國中生活科技教師的行政（服務）工作分析

行政（服務）工作指生活科技教師在學校中協助校務發展及教學之外的工作內容。民國110 年行政院通過教師法修正草案，明列出教師有擔任行政的義務，儘管身為專任的生活科技教師，仍需配合學校的發展計劃與方向，適當參與及配合行政工作的施行。此外，因應十二年國教科技領域，關於科技領域的相關政策與計畫也將由生活科技教師協助實施。

一、生活科技教室之設備經費運用

依《教育部國民及學前教育署補助國民中學與國民小學推動十二年國民基本教育科技領域課程作業要點》，自民國 107 年起有三年的逐步經費補助措施，包含建設生活科技專科教室、補助 60 萬元的基本設備經費、額外申請 40 萬元擴充設備經費等。待校方向教育局申請經費後，後續的教室建置、設備採購、機器維護等將由校內生活科技教師們共同完成（潘怡安，2021）。

二、參與科技領域輔導群等教師專業支持社群

教育部國教署於民國 106 學年度成立科技領域中央輔導團，而各縣市地方科技領域輔導團也逐年成立，各校生活科技教師有時需配合中央或地方科技輔導團的參觀訪視，或參加其辦理之相關研習活動，李易穎（2017）也曾提到在十二年國教下，生活科技教師應有參加或組織教師專業學習社群的能力。

三、參與校內教學研究會及課程發展委員會等會議

各校皆設有課程發展委員會，而為推動各領域的課程規劃與執行，課發會之下又再設有各領域的教學研究會。生活科技教師需定期參與科技領域的教學研究會，及其相關業務如繳交學期課程計畫書，以及參與校內課程發展委員會之會議等。

肆、國中生活科技教師的研究工作分析

研究工作為生活科技教師個人對於教學所進行的行動研究、個人進修與職涯發展的內容。

一、實施教育專業創新與行動研究

全台各縣市皆設置「教育專業創新及行動研究競賽」，以臺北市第 22 屆的佳作得獎主題「STEAM 教育新風貌－以校內生活科技競賽經驗分享為例」為例，為與生活科技科有關的參與紀錄。

二、個人學位進修與職涯深入發展

依據《教師進修研究等專業發展辦法》，為鼓勵教師們進行專業發展，教師可於國內外機關或大專院校進修學位、學程或學分班，對於許多教師來說，從事個人學位進修也是一項不錯的選擇。

伍、十二年國教下國中生活科技教師的工作內容

一、研究設計與實施

（一）研究方法

職能分析的方式有許多種，根據 Gonczi 等人（1990）所提出的四大職能分析方式，包含訪談類、調查類、集會類及其他類。本研究將使用訪談法，與專家檢核訪談大綱後，進行半結構式訪談。以立意取樣的方式，透過與訪談對象的線上會議，蒐集關於國中生活科技教師的職務內容、責任義務等詳細資料。研究者於 2022 年 5 月個別訪談 1 位國中生活科技專任教師和生活科技本科教師出身的主任與校長各 1 位，共 3 位訪談對象。因受疫情影響，訪談採用 Google Meet 線上方式進行，每次的訪談時間約 45 至 60 分鐘，在研究對象的同意下全程錄影錄音。

（二）研究對象

實施訪談法於職能分析時，需注意訪談對象必須滿足研究目的與問題所涉及的相關職務經歷（勞動部勞動力發展署，2017）。本研究的研究對象由生活科技本科專業出身之現職專任教師、主任與校長組成，皆擁有豐富且優良的教學資歷，足以成為其他生活科技教師之楷模，且對於十二年國教之相關教學、行政計畫、競賽等有深入的理解及參與，三位之經歷背景詳見圖 3。

圖 3

三位研究對象之背景

研究對象A	教學	(1)基隆市科技領域輔導團團員 (2)教育部中等教育階段科技領域教學研究中心種子教師 (3)國教署生活科技非專長教師培訓研習種子講師 (4)國教署夢的N次方教師專業成長研習科技領域講師 (5)國立臺灣師範大學中學創新自造教育深耕計畫衛星學校種子教師
	研究	(1)教育部審定版科技領域生活科技教科書作者 (2)出版無人機專書（為中學的工程設計與機電整合所設計） (3)第108學年度自造教育及科技領域教學教案設計競賽-金牌
	競賽	(1)第109學年度全國生活科技創作競賽「任務挑戰競賽」-第二名 (2)第107學年度全國生活科技創作競賽「任務挑戰競賽」-第四名

研究對象B	教學	(1)臺北市科技領域兼任輔導員（近十年） (2)國立台灣師範大學自造大師衛星學校種子教師 (3)第110年「臺北酷課雲「自主學習活動暨教師線上教學教案競賽」-優等 (4)第109學年度教育部國民中小學「自造教育及科技領域教學教案設計競賽」-佳作 (5)第107年度臺北市國民中學「有效教學教案設計徵件比賽」-特優
	行政	(1)臺北市立某自造教育及科技中心主任
	競賽	(1)第110年度「START！智慧小車競賽」-最佳造型獎 (2)第109年度「START！智慧小車競賽」-最佳技術獎 (3)第106年度「中華民國公私立國民中學生活科技創作競賽」-第三名

| 研究對象C | 行政 | (1)推動教育部107學年度科技前導學校實施計畫
(2)臺北市國民教育輔導小組-科技領域召集人
(3)規劃建置台北市某科技中心
(4)臺北市教師專業成長躍進計畫-領域課程研發學習社群
(5)行政經歷21年 |
| | 研究 | (1)教育部十二年國教國中小階段總綱、領綱宣導種子講師
(2)十二年國教課綱國民中小學標準本位評量計畫國中科技領域生活科技組諮詢委員 |

（三）研究工具

　　依據研究目的擬定之半結構式的訪談大綱，經過與生活科技領域資深教育學者的多次討論，檢核訪談大綱中訪談問題與研究目的的適切程度及關聯性，確定訪談大綱的內容效度。訪談大綱如表 1，依研究目的分為「教學工作」、「行政工作」、「研究工作」三大主題，每個主題各有兩個訪談問題。

表 1

訪談大綱

研究目的	主題	訪談問題
1.探討十二年國教國中生活科技教師之教學工作	教學工作	1.您認為在十二年國教下國中生活科技教師的教學工作包含哪些主要工作項目？ 2.呈上題，您認為每個工作項目底下應包含哪些內容？
2.探討十二年國教國中生活科技教師之行政（服務）工作	行政工作	3.您認為在十二年國教下國中生活科技教師的行政工作包含哪些主要工作項目？ 4.呈上題，您認為每個工作項目底下應包含哪些內容？
3.探討十二年國教國中生活科技教師之研究工作	研究工作	5.您認為在十二年國教下國中生活科技教師可能進行哪些研究工作？ 6.您認為在十二年國教下國中生活科技教師的研究工作包含哪些重要的工作內容？

二、資料處理與分析

（一）訪談資料之編碼分析

　　為求研究結果完整，每個研究目的不僅由一位研究對象回答，而是皆由兩位研究對象回答後再進行統整。訪談結束後依訪談錄音檔及研究者筆記完成逐字稿，研究者將逐字稿中回應研究問題的概念、實際做法與看法態度等依照訪談對象編號進行編碼分類，表 2 為訪談資料對應研究目的後的編碼及分類原則。最後以研究者、訪談者及科技教育專家學者的三方觀點進行三角驗證，確認訪談資料的編碼與分類正確無誤。

表 2

訪談資料對應研究目的之編碼及整理原則

訪談對象編號	對應之研究目的	研究結果分析重點
A、B	目的一（教學工作）	(1)課程的規劃與設計 (2)課程中進行的教學 (3)評量 (4)生活科技教室的班級經營 (5)生活科技教室的管理 (6)維持教學專業能力
B、C	目的二（行政工作）	(1)生活科技教室的規劃 (2)科技領域之相關計畫 (3)公開觀課 (4)擔任領域召集人或科目召集人 (5)擔任行政組長
A、C	目的三（研究工作）	(1)行動研究及教案競賽 (2)帶隊競賽 (3)提升教學成效 (4)設計多元評量 (5)融入教學科技
編碼原則：訪談對象-對應之研究目的-研究結果分析重點-概念（-子概念）		

（二）信效度及研究倫理

　　為確保訪談內容效度，研究者在設計訪談問題時除了彙整相關資料外，也邀請國內科技教育學者確認訪談問題與研究目的之對應關聯性，並進行多次的討論與修正。此外，研究者於訪談前一週寄訪談大綱給訪談對象，確保其對研究有初步了解，回應更全面且經思量，以提升研究效度。訪談完畢後研究者將整理過的逐字稿再次寄給訪談對象參閱，以確保逐字稿內容與研究對象要表達的概念相同無誤，藉以確保訪談結果的信度。整理結果發現，三位訪談對象重複提及各項工作內容，確保收集到的研究結果全面性地包含了生活科技教師的真實工作內容。此外，本研究謹守研究倫理，對於訪談對象的個人資料絕對保密，並在逐字稿中關於訪談對象的身分、服務機構等相關經歷以匿名處理之。

陸、結果與討論

一、十二年國教國中生活科技教師之教學工作

　　教學工作的定義為所有與指導學生相關的工作，為生活科技教師例行性的每日工作內容，且教學對象為該教師教授班級中的每一位學生，工作時段包含課前、課中、課後的準備與進行，授課內容為符合十二年國教國中生活科技課程綱要的教科書課程、自編課程等。與前述文獻探討不同的是，教師指導學生參加競賽之工作不包含在此，因參加競賽的學生僅為少數族群，指導的內容也較一般課程更加深加廣，因此歸類於研究工作中，將於「三、十二年國教國中生活科技教師之研究工作」中進行深入討論。

（一）課程的規劃與設計

　　1.教學流程的規劃

　　生活科技課程往往需要多週時間進行，教師應從學期初就妥善安排每個授課班級的整學期進度規劃。

　　教師必須確保教學過程的流暢性，所以要做全面性的規劃。像是段考間有幾週、幾節課，要教什麼教學內容，該如何分配節次與進度。(A-1-1-1-1)

　　生活科技課程每週僅授課一次的特性讓課程進度的彈性降低，在實務面上很可能遇到國定連假、段考、校外教學等而導致某些班級的上課週數大幅減少，教師必須提早知悉並妥善規劃，確保課程結束時讓九成以上的學生都足以完成作業、完善整個學習歷程。

　　2.實際試做課程活動

　　教師應在正式授課前將該課程的活動完整實作至少一次，親自經歷學生的學習歷程，以妥善分配課程進度。

　　要教學生做東西之前自己至少要先試做過才有辦法教，才知道整個製作過程、流程要如何帶給學生，也可以妥善抓好時間。(B-1-1-2)

在試做中規畫有利於學生加工的製作過程，甚至需要考慮教室設備數量是否會供不應求，避免學生浪費許多時間在排隊，這時教師可以安排其他工作同時進行，確保進度不要延滯、減少排隊現象。試做中也能發現實作課程的應注意之處、可能受傷之處，在教學時加強提醒學生，減少受傷事故發生。

3.課程包準備

課程所需用到的所有資料、材料、設備等，在課前準備完成，包含授課簡報或板書內容、自製講義或學習單、教學材料採購與備料、教學及加工所需之工具與機具清點、採購與維護等。

設計整個課程會用到的講義、簡報、學習單等。(B-1-1-3-1)
教學材料及設備的採購。(C-1-1-3-2)

4.評分方式的訂定

需依據學生的能力及預計的教學進度來規劃，訂定評分方式可以參考教科書的建議，但教師仍需有能力隨時調整。

教師可以參考課本提供的評量方式，但有時還是需要根據學生的能力或教學進度等其他因素，需有能力自行調整評分方式，讓其適合學生的現況。(A-1-1-4)

訪談對象亦表示近年來學生的手作能力有些微下降，同樣的內容需要花更多時間才能完成，這就是教師需要注意且進行調整的部分。

5.課程調整與修正
教師應就自己所觀察到的及學生呈現的內容對課程進行改良或修正。

課程全部完畢後，會調整課程或流程使其更順暢，也會調整簡報，跟同事分享各班的教學情況，找到更好的方式教學。(B-1-1-5)

無論教師的教學經驗是否豐富，每屆面對的學生仍然不同。如加工流程的順序安排，或許可以縮短學生的加工等待時間、減少製作錯誤或受傷的原因等，再如授課簡報也可依據學生的反應進行調整，標示更加清楚、貼近學生認知。

6.其他（使用自編教材者）

教師務必於課前確認自編教材符合十二年國教課綱的範疇，也因此可能有額外的教學工作。

確實有很多生活科技教師會用自己的教材，那麼這位生活科技教師可能會有額外的教學工作。(A-1-1-6-1)

要確保自編教材符合課綱。(A-1-1-6-2)

在十二年國教上路前，有許多資深教師已有應用多年的課程與教材，也確實有許多教師目前仍繼續使用自編教材或九年一貫時期的課程，不過若仍持續使用這些教材在十二年國教下進行授課，教師務必於課前確認這些教材符合十二年國教課綱，如將課程目標、學習內容及學習表現等參考指標與課綱進行比對確認。

（二）課程中進行的教學

課程中進行的教學包含三項，分別為知識性內容的呈現、操作性的作業演示以及學生疑難的排解。

課程中的教學就是知識性的內容呈現(B-1-1-2-1)

以及操作性的作業(B-1-1-2-2)，看是透過示範還是學生的練習。

學生有任何的疑難或問題，教師要用示範還是講述去解答？這些都是在課中教學很重要的部分。(B-1-1-2-3)

呈現教材中知識性的內容，如科技系統的簡介、科技發展的起源與演進等，可以配合教科書或學習單做討論與介紹。操作性的作業包含工具及機具的示範、加工方式與技巧的演示，大多數教師使用現場示範教學，也有些教師錄製影片供學生課前預習，可以避免學生圍繞在教師身邊觀看的擁擠或困難。學生的疑難排解包括前述兩者在講解或示範時學生的提問，以及學生在製作作品時碰到的困難與疑惑，甚至是加工失敗、製作錯誤時的補救措施等。

（三）評量

評量工作會因多元評量的方式而有所不同，生活科技課程常使用實作評量及檔案評量。

生活科技教師常會被家長質疑成績太過主觀，所以以我們學校來說，除了較有標準性的測試、測量成績，我們還會加上筆試，將紙筆測驗放在定考分數中。(B-1-3-3)

實作評量包含課程中進行的作品實測成績、作品評分等；檔案評量則是學習單或歷程紀錄表等作業，包含設計圖、製作歷程、小組討論等。以上兩種評量方式可兼顧學生實作課程的過程及結果，然而評分依據都較主觀，教師可視情況增加紙筆評量於定期評量筆試中，實作評量則是增加有標準性的測試條件與規則，確保學期成績的標準性與客觀性。

（四）生活科技教室的班級經營

生活科技課程的進行方式與原班教室教學有諸多不同，教師需要教導學生共同維護生活科技教室空間的安全與衛生。

生科課上學生不會乖乖坐在座位，他會站起來走來走去，所以在班級經營這塊，常規的課堂要求就很重要。(B-1-4-1)

教室中機器跟工具的教學使用及安全要求規範。(B-1-4-2)

學生在生活科技教室中不時需要起身加工、拿取工具或進行討論等，這與在原班教室授課有很大的差異，同時生活科技教學更多是動態的機具示範、工具操作，這時班上秩序就需要教師特別注意與拿捏。此外，教室中所有的機具設備及工具的使用、擺設、安全規範也很重要，不當使用或嬉鬧都可能發生受傷事故。

（五）生活科技教室的管理

使用教室內的機具需要具備操作知識，不可讓一般學生或其他教師皆可隨意出入。

我們會在專科教室上課而非一般教室，管理生科教室是每個生活科技教師都無法避免的。(A-1-5-1)

生活科技教室中要有材料區、廢料區的規劃。(C-1-5-6)

生活科技教室的人員需要有進出管控，因應新課綱的資訊融入教學及跨領域整合課程，生活科技科以外的他科課程也有可能會借用生活科技教室的機具設備，當他科教師也想使用教室資源時，設備器材借用的管控也是生活科技教師的管理範疇。而工具設備的維護與保養，在學期開始前教師通常需要先到生活科技教室確認機具的狀況及打掃教室，授課階段也需規畫教室內空間規劃，如加工區、材料區、短料區等。

（六）維持教學專業能力

教師必須理解十二年國教的重要內涵，更應對於課綱訂定的學科知識內容保持精熟。

製作輔具或教材幫助學生提升學習成效，紙本的、實體的、多媒體的、虛擬的方式都可以。(A-1-6-3)

我覺得多參加各單位辦理的各式研習，可以有新的點子去規劃課程。(B-1-6-4)

網路自學這塊我覺得蠻重要的,國內外的影片甚至是網紅的影片我覺得都有參考的價值。

(B-1-6-5)

符應十二年國教「終身學習」的精神,科技領域的生活科技教師應與時俱進,也同林弘昌、陳彥綸（2019）研究結果指出,生活科技教師需參加增能課程或網路自學,提升自我專業能力。此外教師應致力於提升學生的學習動機與學習成效,如在課程中製作輔具或教材來幫助學生更易於理解,或是製作加工治具以利學生操作,也可以應用多媒體教材,拍攝機具操作影片等。

二、十二年國教國中生活科技教師之行政（服務）工作

行政（服務）工作的定義為生活科技教師在非擔任正式行政職時,可能需要參與或處理的行政業務,或許與學生及教學並無直接交集,卻有著極大的關聯,同時也與十二年國教密不可分,這些行政（服務）工作有可能出於自願或非自願（指派）的形式。此外,亦探討身為生活科技教師較可能擔任的正式行政職位。

（一）生活科技教室的規劃

儘管生活科技教師未擔任行政職位,仍需要積極參與生活科技教室的規劃與建置。生活科技教師對於採購的機具與設備之廠牌規格等資訊應有所了解,以免採購錯誤而損失經費。

教師會與設計師共同規劃教室的空間如何安排,包括桌椅擺放、櫃子、教室上課動線、安全等。(B-2-1-1)

電源（配線）的規劃與了解,電源的規劃很重要,還會牽涉到總務處。(C-2-1-5)

教師可能要詢問別人創課教室要做什麼？或是心中要有課程規劃,才能做這間教室,不能買到教師自己根本不會使用的機器設備。(C-2-1-6)

建置一間生活科技教室時,需要生活科技教師的專業與意見,避免全權讓非生活科技專業的同仁安排,例如與設計師討論教室空間的規劃、關注教室建置工作的情形。此外,在規

劃生活科技教室前建議教師也應規劃課程，在課程的需求下增購或建置一間適用的生活科技教室，這些工作內容與《教育部國民及學前教育署補助國民中學與國民小學推動十二年國民基本教育科技領域課程作業要點》中所提及的內容相同。此外，在執行這些工作時還會與校內其他行政單位有關，例如與教務處、總務處同仁的溝通協調。

與前述生活科技教室管理差異之處為「規劃」與「管理」的定義，在本研究中生活科技教室的「規劃」意指該校原本沒有生活科技教室或僅有空間而尚待建置，教師幾乎是從零開始建置；而生活科技教室的「管理」意旨該校的生活科技教室已建置完畢，基礎的工具設備及教室環境已備妥，僅需教師日常的管理及維持。

（二）科技領域之相關計畫

學校的經費來源與承接專案計畫兩者密不可分，需要校內同仁爭取承接計畫，而相關計畫有些為競爭型計畫，有些則為指派型任務，以下是一些訪談的佐證資料。

競爭型計畫，現在因為資源有限，由各校自行爭取。(C-2-2-1)

也有可能是教務部指派某項計畫或任務給校長，像是作前導學校、試辦學校。(C-2-2-2)

教育部活化計畫，是社群、分組合作學習的計畫，每個學校幾乎都有，底下還有四五個子計畫。(C-2-2-3)

科技中心的子三計劃有兩種，有教師來上課或是經費給學校自己上課買材料再提供教案給科技中心，然後把收據給科技中心核銷，以及成果、課程敘述或照片紀錄等。(C-2-2-4)

過去資源較豐沛的草創時期常見到的是指派型任務，如某些學校被欽點為「前導學校」或「試辦學校」，教師需要承接計畫工作，這與賴榮飛（2017）在「科技領域的課程推動與配套規劃」中所提及的資訊相同；現在逐漸變成競爭型計畫，需要教師或行政職積極爭取才有經費。目前各校較常見的是配合科技中心的子三計畫或競賽承辦等，還有不分科皆有可能承辦的教育部活化計畫、合作學習計畫等。

（三）公開觀課

公開觀課的內容包含課前共同規劃課程、課中實際參與觀課、課後研討教學成果及給予專業回饋。

最近這幾年都需要公開觀課。(B-2-3-1)

依據《國民中學與國民小學實施校長及教師公開授課參考原則》，國民中小學之校長、專任教師、兼任行政職務之專任教師、代理教師等，每學年皆應公開授課至少一次。

（四）擔任領域召集人或科目召集人

領域召集人或科目召集人的工作內容廣泛，且依各校情形有所差異，主要包含教學研究會、校內會議、領域課程計畫撰寫等。

生活科技的課程設計計畫撰寫，比如說整學年度的或是各年級的課程設計的計畫撰寫，與教學非常有關係。(C-2-4-4)

可能還有國際教育（海外筆友、海外姊妹校活動），或新興科技的課程教育（元宇宙、AR、VR、XR），或永續發展目標 SDGs 的相關課務（目前很多學校在做），以上皆包含研習溝通、工作規劃、經費採購及核銷等。(C-2-4-7)

教學研究會之相關業務如安排領域研習課程、舉辦領域會議；參與校內會議如課程發展委員會會議、教師評選會議；撰寫生活科技課程計畫包含各年級的課程設計，或指派領域下其他教師呈交課程計畫；撰寫科技領域的經費或計畫，雖然並非正式行政職，但生活科技的專業內容仍需生活科技教師參與；傳達行政訊息給該科教師群，如線上課程實施、校務事項。此外，依各校情況不同，有可能因應學校轉型為雙語學校而設計雙語課程，或其他彈性課程如跨科或跨領域的活動、新興科技教育，甚至是國際教育、永續發展目標(Sustainable Development Goals, SDGs)等的相關業務，包含研習課程規劃、經費運用及採購等。

（五）擔任行政組長

　　生活科技教師較可能擔任的正式行政職為教務處設備組長及資訊組長，當然亦有許多擔任其他行政職的機會。

　　我覺得生活科技教師比較容易接到的行政工作就是設備組跟資訊組。(B-2-5-1)

　　秉持著熱誠、積極想解決的態度，態度蠻重要的。(C-2-5-4)

　　跟導師的溝通，很多時候處理事情時需要導師跟學生傳達，導師是你的助力。(C-4-6)

　　與家長的溝通。行政有時候會直接對到家長，要換位思考幫家長想，用對方的角度來做事情。(C-2-5-7)

　　擔任行政職應秉持熱誠與積極的態度，運用適當的溝通方式與校內各行政單位合作，並學習公文書的寫作，例如上簽呈、寫計畫、爭取並運用經費；也需要與導師及家長溝通，透過導師來聯繫親師生，例如教室管理、教科書發放；有時行政職會直接與家長對接，例如發通知給家長或家長致電，需要理解家長的需求。

三、十二年國教國中生活科技教師之研究工作

　　研究工作的定義為生活科技教師為增進教學專業能力或配合學校整體發展而進行的工作，以及擔任指導部分學生更加優秀、參賽競爭的專業指導者，為符合實務所需教師可能需要進行加深加廣的學習及研究，這些研究工作可能出於自願或非自願（指派）的形式，也可能需要花費教師課餘或自由時間來將其完成。

（一）行動研究及教案競賽

　　參加行動研究和教案競賽是目前生活科技教師很重要的研究工作之一。

　　以台北市的學校來講，行動研究是一件重要的事情，你可能每年都要參加，或是隔一年就要參加。(C-3-1-1)

教師可能經由參加教師行動研究相關社群，或是為達成長官的工作期望，亦或是因自身興趣而從事行動研究。包含各縣市的教學行動研究徵件，如「臺北市教育專業創新及行動研究徵件」，依學校狀況參加的頻率有所不同。此外還有其他教案比賽，例如親子天下的創新教案、教育部教案徵件、教學卓越競賽等。

（二）帶隊競賽

與三位訪談對象深入討論後發現，三位皆不認同帶隊競賽應被歸類於教學工作中，由於競賽指導的內容大多超出平時所教授的範圍，多為加深加廣的知識與技術應用，且指導對象為特定一小部分學生，並非普及的教學。一位訪談對象認為應將其歸類為獨立工作、兩位訪談對象認為適合歸類於研究工作，有鑑於此，研究者將帶隊競賽從原先的「教學工作」項目中移除，移至「研究工作」中深入討論。

我覺得競賽較適合歸類在研究工作，不是每個教師都一定會帶到比賽，教學對象又是比較小部分的學生。(A-3-2-1)

我覺得競賽工作是獨立出來的，以生活科技教師來講很像理化教師帶科展，它不是生活科技教師整個教學的工作之一，比較像是外加工作，但也不算是行政工作。(B-3-2-10)

競賽真的蠻複雜的，要找時間、要找人、要有材料、有工具，要花額外的時間，所以競賽是可以歸類在研究。(C-3-2-15)

1.提升自我專業能力

教師可能為了指導競賽而參加額外的增能課程，或自行鑽研十二年國教課程以外的知識與技術，學習管道除了參與研習外，還有網路自學或競賽觀摩等。

不是每個教師都能做到，會需要參加研習增長專業能力。(A-3-2-2)

我會去其他縣市觀摩，會知道比賽過程評審關注什麼，回來後我不會直接跟學生說，但

我會用引導或提示的方式讓學生思考。(B-3-2-6)

指導競賽與平時授課的教學方式不同，訪談對象在指導競賽時多使用旁敲側擊的方式，而非直接公布最佳方案或口令式教學，在訓練期間養成學生獨立思考的習慣，學生方有解決比賽突發狀況的能力。

2.指導與陪伴學生

指導競賽的教師是非常辛苦的，需要利用課餘或下班時間陪伴學生。

可能需要幫學生規畫準備競賽的內容、時間及進程等。(B-3-2-4)

要花時間陪伴學生，或是指導，依照學生的能力有區別。(B-3-2-3)

競賽結束後可能會舉辦類似慶功宴、出去吃飯的活動安排，讓學生有個完美的 ending。 (B-3-2-9)

教師需要帶學生一同規劃備賽進度，讓學生了解自己該做什麼。每屆學生資質不同，儘管是指導競賽已有多年經驗的教師，也需要重新認識選手的能力。若是大校，教師可能會同時訓練兩、三隊選手，互相觀摩學習，建立學生的榮譽感及信心、提高參與度。競賽後無論是否得獎，教師都應給予適切的鼓勵與建議。

3.參與競賽之相關準備工作

參與競賽的相關工作包含許多繁瑣的內容如下。

在平常生科課時就尋找能參賽的選手。(B-3-2-5)

生科教師也要考慮到前去參賽的路程安全性，同縣市內的競賽可能還好，如果要跨縣市的話就要多注意。(B-3-2-7)

也有可能需要跟家長溝通，像是寫同意書等比較細節瑣碎的東西。(C-3-2-14)

經費核銷，例如材料工具採購、車馬費。(C-3-2-13)

　　首先，教師須於平時教學工作中觀察並選拔選手或鼓勵學生參賽；其次，教師需要考慮學生前往競賽的路程安全性，縣市內的競賽通勤較為方便，但全國性的競賽則需要跨縣市移動；其三，學生需要花許多額外時間訓練，參加競賽更是要到不同場地，要與家長有明確告知及良好溝通；其四，在準備競賽的材料與工具上，也會有經費核銷、請款等的行政作業需要完成。

（三）提升學習成效

　　包含教材的研發與更新，讓新興的知識融入教學中，以及調整教學方法以促進學生的學習成效，如翻轉式教學、異質性分組等，教師成為陪伴者與引導者的角色。

　　教學方法的改良，例如嘗試翻轉教學搭配異質性分組。(A-3-3-2)
　　教學教材跟十二年國教學習重點的課程轉化，包含教學策略、差異化教學、特殊學生的教學策略或輔具。(C-3-3-4)

　　比如十二年國教才普及的雷射切割或 3D 列印的應用課程，以及十二年國教下的木工設計課程更加注重問題解決或創意設計，而非強調學生在製作作品的技藝精熟程度，需轉化舊有課程內容，以符應十二年國教新課綱的教學理念與目標，這與林弘昌、陳彥綸（2019）的研究結果相同，生活科技教師會藉由參與教師專業成長社群或其他管道，提升自己教學的專業，促進學生的學習成效。

（四）設計多元評量

　　使評量方式更加多元，評量結果更趨客觀。

　　包含學習歷程心得簡報報告、學習單（按照教師想教的東西，逐步的引導或學習線索）、

口頭問答、總結性的作品展示。(C-3-4-1)

線上評量。(C-3-4-2)

混成評量，例如簡報報告、歷程錄影等。(C-3-4-3)

過去生活科技課程的評量多為作品評分，為讓評量不再限於作品的成績，需增加包含歷程性的紀錄與紙筆評量，如學習心得、歷程簡報等，以及口頭問答、作品展示分享。因應多變的生活環境及實際需要，教師也需設計線上評量、混成評量，如作品及製作歷程的拍照或錄影、線上表單等，隨時調整評量方式以滿足現況所需。

（五）融入教學科技

因應十二年國教及日新月異的科技進步，資訊融入教學成為各科教學的趨勢，教師需要主動使用數位工具與其相應之教學策略將教學科技整合於課程中。

融入多媒體及數位工具於教學。(A-3-5-1)

融入教學科技更多的是提供學生在課程中一個新的工具與媒介，其目的同樣是為增進學生的學習成效、幫助解決問題，用以支援或延伸課程的目標。

柒、結論與建議

本研究的目的在探討十二年國教下國中生活科技教師的工作內容，經彙整相關文獻資料與訪談內容後，提出以下的結論與建議：

一、結論

（一）十二年國教國中生活科技教師之教學工作包括課程的規劃與執行、評量、班級經營、教室管理及維持教學專業能力

詳細的工作項目為「課程的規劃與設計」、「課程中進行的教學」、「評量」、「生活科技教室的班級經營」、「生活科技教室的管理」、「維持教學專業能力」六項主題，包含與指導學生

有關的所有工作細項，且需符合十二年國教新課綱所訂定之精神與原則。

（二）十二年國教國中生活科技教師之行政（服務）工作包括規劃生活科技教室、參與科技領域相關計畫及執行學校校務行政工作

詳細的工作項目為「生活科技教室的規劃」、「科技領域之相關計畫」、「公開觀課」、「擔任領域召集人或科目召集人」、「擔任行政組長（設備／資訊組長等）」五項主題，除了後面兩者之外，大多為因應十二年國教下所產生的新工作內容。

（三）二年國教國中生活科技教師之研究工作包含參與行動研究及教案競賽、帶隊競賽及其他能促進教學成效之研究工作

詳細的工作項目為「行動研究及教案競賽」、「帶隊競賽」、「提升教學成效」、「設計多元評量」、「融入教學科技」五項主題，這些工作看似與過去相同，然而在十二年國教下，其詳細內容已經有所增加與改變。

二、建議

（一）科技領域教師需更注重終身學習以增進科技新知

科技本身即是日新月異的，這是科技領域教師與他科教師的最大差異之處，生活科技的教材內容可能每隔幾年就會更新，換言之教師必須更注重終身學習的精神，因此建議生活科技教師參與研習課程或透過網路自學等方式，不斷汲取新知，拓展並維持自身的專業能力。

（二）生活科技教師應主動參與生活科技教室的規劃修繕及採購設備

課程是教師規劃的，教師也最了解自己的能力，教室的規劃與設備採購生活科技教師務必要主動參與，切勿因為自身非行政職，就讓學校處理修繕或採購相關業務的同仁全權處理，否則建置完成的教室與採購的設備非教師真正需要的，對教學幫助有限也浪費寶貴經費。例如教師要提供工具設備的規格，方便總務處的採購，以免採購錯誤。

（三）生活科技教師在指導競賽時應多以引導方式訓練參賽學生

近年科技領域的相關競賽眾多，不少生活科技教師被賦予指導學生參加競賽的工作。雖然模仿或復刻教師的作品是一個速成的訓練方式，但引導的方式能讓學生學習到更多，且在十二年國教下的生活科技更加注重學生「問題解決」的能力，競賽也將此做為學生的挑戰，在獨自面對比賽當下需有能力解決練習時不曾出現過的突發狀況，這也是最後能否在競賽中

脫穎而出的關鍵因素。

（四）十二年國教下生活科技教師應重視調整教材的能力

對於大部分的生活科技教師來說，獨自研發教材並非首要且必要的能力，能夠調整課程並忠實地呈現課綱精神才是首要能力。當教師參加增能培訓或研習課程後，應能夠將這項增能課程調整至適合該校實行，教師需要考慮自身專業能力是否已充足、學校的客觀環境及設備是否完善、是否滿足該校學生的學習動機及需求等，未必馬上就要開始著手研發新教材，而是教師要有能夠調整教材的能力才是關鍵。

三、研究限制

本研究之研究對象不僅有生活科技教師，還有生活科技本科出身的主任及校長，包含教師的上級長官作為研究對象是為得到更加全面而實務的研究結果，但也可能由於研究對象現職的工作崗位與身分，而對生活科技教師一職的工作內容有其他的要求與期待，是為本研究之研究限制。

未來的研究建議可以對生活科技教師及生活科技教師之上級長官，分別訪談數位後再進行結果的比較與探究；或是限縮調查範圍，僅針對某些特定地區或有其他身分的生活科技教師進行工作內容的調查，例如偏鄉教師、生活科技雙語教師等。

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中小企業導入 TTQS 之阻礙及因應策略

J Difficulties and Strategies Countermeasures of Promoting TTQS in Small and Medium Enterprises in Taiwan

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摘要

　　勞動部勞動力發展署（簡稱勞動力發展署）為了因應國際人才培訓趨勢，自 2007 年開始推動「人才發展品質管理系統（簡稱 TTQS）」，導入的訓練單位超過上千家，但真正導入的企業卻佔全國企業的比例不超過 1%，甚至在許多中小企業內部進行教育訓練上面臨了單位人力的不足、訓練移轉成效不佳等問題，因此本研究之目的在於探討勞動力發展署推動 TTQS 在中小企業可能遇到的阻礙並提出適當的因應策略。首先，藉由文獻探討及文件分析瞭解過去導入 TTQS 的企業成功的關鍵因素，及三類專業人員在實際面對訓練單位所面臨到可能的阻礙，以 SWOT 分析 TTQS 被導入中小企業的內外部優劣勢分析，再以 TOWS 矩陣策略分析提出 4 項策略分別為 SO 進攻策略、WO 改善策略、ST 緩衝策略及 WT 保守策略，希望可以供企業及政府機關作為參考。總的來說，建議企業應重視教育訓練，且勞動力發展署應通盤檢討所有與 TTQS 有相關的教育訓練補助計畫並持續推廣、放寬對中小企業申請的標準與校準三類專業人員的共識及指標內涵，以正向引導的方式繼續推動 TTQS，藉此提升企業人才發展品質。

關鍵詞：十二年國教、國中生活科技教師、工作分析

關鍵詞：十二年國教、國中生活科技教師、工作分析

壹、前言

　　勞動部勞動力發展署（以下簡稱勞動力發展署）為因應人才培訓的趨勢，自 2007 年開始推動「臺灣訓練品質管理系統 Taiwan Training Quality-management System」，前期以訓練品質為重，後期為因應應用範圍擴散，並促進人才發展投資及國際接軌，於 2014 年正式更名為「人才發展品質管理系統 Talent Quality-management System」（簡稱 TTQS）（勞動力發展署，2021a）。更名 TTQS 的目的也是希望訓練單位可藉由 TTQS 的導入，循序推動訓練品質持續改善機制，使訓練從「成本支出」的觀念，轉變為「人才投資」，讓「人才」成為訓練單位最重要的資產（張仁家、陳錦堂，2017）。

　　據公開數據顯示，自 2015 年至 2022 年止，企業單位申請的企業機構版及辦訓能力檢核表總和家次從未超過訓練機構版及外訓版總和評核家次。2021 年申請 TTQS 評核的單位家次共有 1,751 家，其中申請企業機構版及辦訓能力檢核表之評核單位僅有 818 家次（勞動力發展署，2023a）。說明臺灣申請 TTQS 的評核單位，仍以對外招收學員的訓練單位為多數；反觀 TTQS 人才發展品質管理系統導入企業內訓的比例偏低，仍待加強。經濟部中小及新創企業署（簡稱中小企業署）也公布 2021 年臺灣中小企業佔全體企業 98.93%（中小企業署，2022），勞動力發展署宜對此找出推動的癥結所在，並持續擴大推廣。

　　本文首先簡述勞動力發展署推動 TTQS 計畫現況，概觀了解 TTQS 整體計畫運作模式，再以文獻探討及文件分析的方法，就過去企業導入 TTQS 的相關研究及多位 TTQS 三類專業人員（含輔導顧問、評核委員、訓練講師）所提出的各項中小企業導入 TTQS 面臨之問題作為本文之研究範疇加以分析，提出 SWOT 分析了解 TTQS 計畫的內外部的優劣勢及機會威脅，接著展開 TOWS 因應策略，並提供建議，未來可供企業單位及相關主管機關參考。

貳、勞動力發展署推動 TTQS 之現況

　　TTQS 發展過程初期係參考英國「人才投資促進方案（IIP）」及國際標準化組織「ISO10015」系統指引融入臺灣的訓練發展產業，建立屬於臺灣官方的訓練品質系統。推動以來經歷了三個階段的願景實現，各項任務如圖 1 所示，從 2013 年起已正式邁入成熟的起飛階段。

圖 1

TTQS 願景實現階段

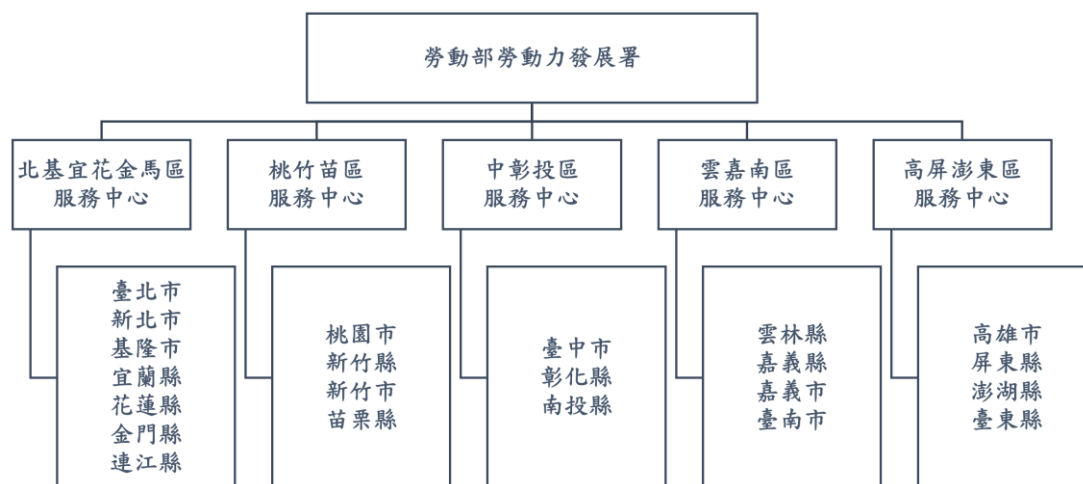| 短期：起步階段
2005-2009年
發展系統 建立標準 | 中期：成長階段
2010-2012年
完備體制 擴大適用 | 長期：起飛階段
2013-2015年
品質提升 能力保證 |

資料來源：勞動力發展署（2014）。

　　現行計畫執行分工，由勞動力發展署督導各區服務中心之各項業務，也包含 TTQS 計畫相關的控管業務及跨部資源整合等；TTQS 服務範圍遍及全臺灣，因此也設立五個分區服務中心執行業務，接受勞動力發展署委託辦理教育訓練、輔導服務、評核服務與相關計畫推廣等，執行架構如圖 2 所示。

圖 2

TTQS 執行架構

資料來源：勞動力發展署（2023b）。

　　PDDRO 人才發展品質管理迴圈，分別為「計畫 Plan」、「設計 Design」、「執行 Do」、「查核 Review」、「成果 Outcome」，從這五大構面發展出一套有關於人力資源的系統化訓練體系。

藉由教育訓練中說、寫、做一致的過程，及依據指標內涵進行持續改善，以求提升人才發展及培訓體系之運作效能，強化國際競爭力（勞動力發展署，2021a）。

TTQS 依版本可分為「企業機構版」、「訓練機構版」、「外訓版」及「辦訓能力檢核表」四種版本。其中企業機構版及訓練機構版獲得牌等則可分為「金牌」、「銀牌」、「銅牌」、「通過」，牌等分數如圖 3 所示，「通過」及以上的牌等皆有 2 年效期；外訓版及辦訓能力檢核表合格分數為 50 分，效期為 1 年。評分每項指標的標準，係依據訓練單位佐證文件資料與評核指標之連結性，及是否有做到知、行、錄、續，以達到 TTQS 的精神。

圖 3

TTQS 指標等級分數標準
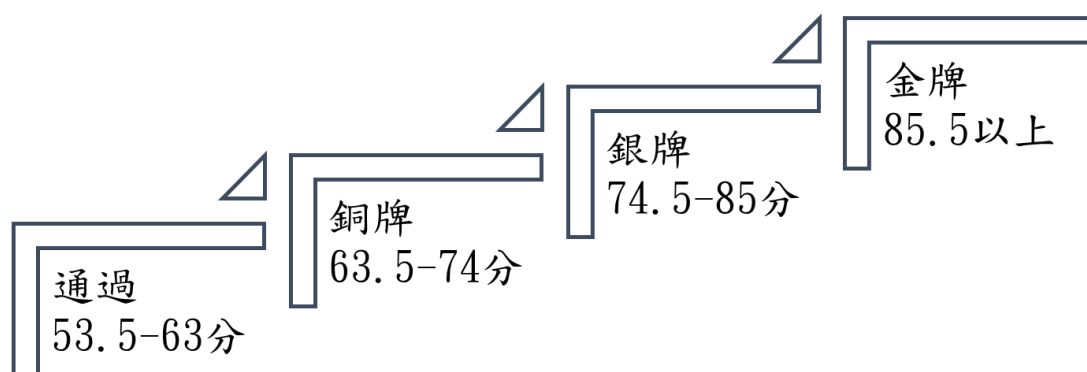
資料來源：勞動力發展署（2023b）。

勞動力發展署公開 2020 至 2022 年訓練單位申請 TTQS 評核統計如表 1 所示，2021 年受疫情警戒影響，較 2020 年減少 192 家次；三個年度申請版本數最多的是訓練機構版，比例皆佔當年度約 50%以上；申請版本最少的則是外訓版。由此表可知，訓練機構版之評核家次三年皆大於企業機構版評核家次，勞動力發展署應對此提出持續改善的策略，並多鼓勵企業申請 TTQS，藉由 TTQS 持續改善企業內部的訓練品質。

表 1

2020 至 2022 年訓練單位申請 TTQS 評核統計表

年度 \ 版本		企業機構版	訓練機構版	外訓版	辦訓能力檢核表	合計
2020 年	家次	701	981	21	230	1,933
	比例	36.26%	50.75%	1.09%	11.90%	100%
2021 年	家次	610	908	15	208	1,741
	比例	35.04%	52.15%	0.86%	11.95%	100%
2022 年	家次	745	967	10	214	1,936
	比例	38.48%	49.95%	0.52%	11.05%	100%

資料來源：勞動力發展署（2023a）。

參、中小企業導入 TTQS 的相關研究與可能的阻礙

　　本文以文獻探討及文件分析的方法，分析過去學者研究中小企業導入 TTQS 的相關碩博士論文，及 TTQS 三類專業人員在執行服務時的所見所聞，歸納出中小企業導入 TTQS 的困難點以及可能會遇到的阻礙，以此為基礎展開後續內外部分析及相關的因應策略，其敘述如下：

一、中小企業導入 TTQS 的相關研究

　　TTQS 人才發展品質管理系統發展至今有若干研究者進行探討，本文綜合整理相關研究列出下表 2。

表 2

企業導入 TTQS 的相關研究整理表

年代	作者	中小企業導入 TTQS 及教育訓練的相關研究
2009	童煥彩	1. 組織導入 TTQS 的主要動機：建立教育訓練標準化流程、運用政府的訓練補助、提升公司人力素質、增加競爭力、提升組織形象。 2. 成功導入的關鍵：高階主管支持、政府資源的運用、全體員工的參與。
2010	黃惇勝、蔡靖一	1. TTQS 最需要改善的部分：強化輔導資源、評核的計分合理性，以便符合企業實務運作程度。
2011	許慧真	1. 規模較大的企業，在組織制度及作業流程上較小規模的企業來說更完善，因此在講師授課、學員學習的滿意度上較高。 2. 大規模企業也設有專門部門承辦 TTQS 業務，因此也更符合 TTQS 評核內涵項目。
2012	曾雅婷	1. P：訓練需求的來源常來自訓練經辦獨自規劃，未與相關利益關係人討論，因此也未能與員工職能落差結合。 2. De：訓練承辦人員往往皆非專責人員，欠缺教育訓練的相關職能。 3. Do：承上述承辦人員無相關職能，導致執行構面皆無適當的遴選機制，僅是為了開課而開課。 4. R：訓練單位不瞭解每階段訓練重點的要求，因此在每階段稽核點上，不知是否落實執行。再者訓練過程未留下異常紀錄，再次遇到相關異常還是無解決之道。 5. O：訓練的效益評估，以 Kirkpatrick 的四階層評估模型，企業所呈現的評估層次仍停留於 L1 及 L2 的展現。
2013	黃健哲等	1. 導入 TTQS 四項關鍵的因素：高階主管的支持與決心、訂定明確的目標與需求的計畫、連結企業績效組織、企業有持續改善的作為。 2. 需搭配相關具體改善作法：編制訓練專責人員，高階主管能親自主持、明確經營目標與職能落差分析、落實訓練需求調查規劃，落實課後檢討及定期性訓練檢討機制。
2013	盧美月	1. 高階主管支持雖與企業培訓無直接關係，但高階主管支持程度越高者，間接員工士氣及生產力越高，同時也符合 TTQS 指標 18 的內涵：「高階主管對於訓練發展的認知、支持及評價。」
2021	黃士豪	1. 導入過程中，輔導顧問及評核委員對指標定義不一致，導致評核結果不如預期，影響成績。 2. 企業導入 TTQS 必須要全體企業全力參與，且事前需與高階主管取得共識及支持。
2021	陳佑如	1. 政府與 TTQS 搭配的相關計畫：申請成立職訓機構、申請政府相關補助計畫（如：人力資源提升計畫）、國家品質發展獎等。 2. 個案公司經營方向、策略與訓練的課程的連結度不夠，也未有相關的檢討機制。 3. 個案公司與培訓合作廠商的討論機制未完全，在設計課程上有盲點產生。

資料來源：本研究自行整理。

歸納表 2 可以得知，企業導入 TTQS 成功的關鍵因素不外乎有：善用政府資源、組織的

高階主管支持、訓練課程須與公司營運目標加以連結等，訓練單位的人力配置上也需要有專職人員進行，與利益關係人全程參與訓練過程，再加上訓練後及定期性的整體檢討機制讓企業辦理教育訓練更完善。TTQS 的導入都是有正面效益的，但在表 2 也可發現，學者們除了認為勞動力發展署應持續重視評核委員及輔導顧問的共識問題、企業的適用程度外，更重要的是這些小型企業缺乏了上述所歸納的各項關鍵因素，而導致小型企業無法進行有效的教育訓練，因此，本研究以中小型企業為探討的對象，從中找出阻礙將更具意義。

　　企業善用政府資源也是成功的關鍵之一，但葉秀經（2013）提到許多企業為了向政府部會申請補助款才勉強進行 TTQS 評核，使得在導入的過程中產生矛盾。政府應是以輔助與減輕企業負擔的角度，設立相關的補助計畫，而非單純為了讓企業獲得補助，企業應建立正確的態度，加強提升企業的訓練效果。

二、中小企業導入 TTQS 可能的阻礙

　　政府雖大力推動 TTQS，但每年評核的家次卻只有不到 2,000 家，且多數為申請訓練機構版的訓練單位。依現況而言，臺灣企業最主要的規模是中小企業，導入 TTQS 的過程除承上述所提之差異外，行政院（2022）也公布 2021 年小型企業人力提升計畫及企業人力資源提升計畫共有 3,253 個事業單位申請，與申請同年度 TTQS 的企業機構版及辦訓能力檢核表的申請家次 818 家相比，仍有近 2,500 家的落差。

　　輔導顧問及評核委員到受評單位進行 TTQS 服務，是第一線瞭解受評單位的人員，在每年度的指標共識研習會議、顧問及委員回流訓練的研討上，皆會有不同的實際個案在會議中被提出，甚至是撰寫成文章發表，因此本章節參考 TTQS 輔導顧問及評核委員過去發表的文章中，整理出五項 TTQS 在中小企業可能遇到的阻礙：

1.企業被動導入 TTQS 系統，且核銷要件並不一致

　　多數辦理教育訓練的企業單位，會額外申請勞動力發展署的相關補助計畫，例如：「小型企業人力提升計畫（簡稱小人提）」或「企業人力資源提升計畫（簡稱大人提）」。根據小人提最新的計畫規定，有 3 年期間申請的輔導及訓練費用，皆由政府全額承擔，後續將依進行的年限逐年遞減補助費用（勞動力發展署，2023c）；而大人提則可依照申請對象的不同分為個別型、聯合型、產業推升型，補助費用依序為個別型補助 95 萬、聯合型補助 190 萬、產業推

升型補助 200 萬（勞動力發展署，2023d）。申請經費辦理員工在職訓練，除了讓公司員工內涵有所提升外，也讓訓練單位減少訓練支出的負擔。

這些計畫規定中，僅有個別型大人提需要有 TTQS 的評核紀錄，因此一般中小企業通常會選擇申請小人提的補助，使得企業對於 TTQS 的申請動力大幅減少，甚至不想進行；大人提中的聯合型及產業推升型，在遞交申請資料及核銷作業時，也不需要 TTQS 的評核紀錄。此外接受補助的企業訓練單位，多數並非自主導入 TTQS 系統，而是為了核銷經費，對個別型的申請企業，僅是勉強以 TTQS 之訓練品質系統架構完成評核內容，指標內容並不瞭解，實際上並無實質內涵（巫忠信，2012），真正會為提升組織內訓練績效的訓練單位仍占少數。除了被動去進行 TTQS 評核，政府在核銷要件上逐漸放寬，讓 TTQS 導入企業持續減少。

2.利益關係人參與度不高，且不明白為何辦訓練

勞動力發展署所制定的企業機構版中，評核指標共有 19 項，教育訓練的過程應有相關之利益關係人參與，藉由利益關係人參與過程，讓教育訓練更完善，同時也要符合 TTQS 企業機構版中的指標 9 及辦訓能力檢核表的指標 6 之指標意涵：課程規劃流程，利益關係人有適當參與課程設計與審查（勞動力發展署，2023b）。企業因為主管及訓練人員皆不清楚訓練的需求及目的，通常是以主管直接下達要學習目標，並未召集相關利益關係人參與規劃相關內容（葉秀經，2013）。甚至規模小的企業，人編制不足外，也較無法滿足企業營運所需，為了節省人力成本會有讓員工身兼數職的情況，沒有空閒時間接受教育訓練（侯秉忠，2012）。

承辦 TTQS 的人員也因流動率高，導致該業務無法維持推展，有些中小企業會委託外部管顧公司承辦相關教育訓練，過程中無留下相關訓練的佐證紀錄，也無培養企業本身的訓練人員（賴尚佑，2013），銜接業務上對於訓練規劃並不瞭解，僅是因為企業需要而進行，因此無法真正規劃出適合企業所需的教育訓練，雖然有進行訓練，但無法與企業的願景使命、年度營運目標做連結，TTQS 的導入也無法彰顯效果。

3.訓練結果無法有效移轉至工作績效

「訓練移轉」是由「學習移轉」擴展而來，主要為受訓者將訓練所學的知識與技能，有效並實際應用在工作上，並可擴展至工作以外的範疇（陳淑敏，2021），是教育訓練規劃重要

環節。為了使教育訓練產生有效且持久的效果，這意味著員工需要能夠將教育訓練中所得到的知識與技能應用到工作場所上(Baldwin & Ford, 1988)，當他們能從教育訓練中所學到的知識來執行工作任務時，就是一種訓練移轉的模式(Burke & Hutchins, 2008)。

張仁家（2023）於《企業發展與訓練》中也提到，訓練是為了提升員工之工作績效，所提供的學習機會，提高成效，因此學習移轉成為教育訓練重要的目的之一，這也是俗稱的學以致用。企業單位甚至希望員工的教育訓練及培訓能夠為組織帶來投資報酬(Aguinis & Kraiger, 2009)，在進行教育訓練評估時，應多方面的參酌，廖晟堃（2005）指出訓練需求的類別有二，其一為決策管理階層或經營策略目標而來，此類以組織變革考量而形成；另一者為工作層級中依目前的績效表現或能力、知識、態度及預期表現的差距而來，所以教育訓練人員在規劃訓練課程時，應參照公司年度經營目標、職能落差及往年的開課成效等進行相關的分析，作為往後課程規劃的依據。

訓練課程的內容對工作的幫助是預測訓練移轉是否有效的重要因素，因為這可能直接影響訓練移轉的有效性(Roszkowski & Soven, 2010)，當企業單位未規劃適當的教育訓練課程，訓練移轉無法發揮效果，在進行 TTQS 評核時，佐證資料即無法展現出來。賴尚佑（2013）提到輔導實務經驗中訓練單位對職能分析、應用及專業知識普遍不足，訓練無法具體提升個別員工的職能缺口。由此可知，若訓練單位人員對職能不熟悉，對訓育訓練評估及規劃上無法真正發揮作用，更遑論讓企業員工獲得有效的訓練。

4.評核及輔導期待產生落差

TTQS 人才發展品質管理系統實施計畫分為教育訓練、輔導服務、評核服務，其中輔導服務及評核服務皆為免費服務。輔導服務是由一位與單位屬性背景相關的輔導顧問，針對訓練單位辦理教育訓練的佐證資料，與 TTQS 指標做連結對應，並且優化訓練單位文件、相關流程及表單的服務。評核服務則是由兩位評核委員，對訓練單位準備的佐證資料進行評核，評分標準係依據訓練單位佐證資料齊全度、簡報內容與指標連結性，依照評核委員的專業度進行，並給予建議與回饋。

TTQS 之「輔導流程」與「評核標準」均有規範可循，輔導顧問先藉由相關資源協助提升企業；評核委員則將指標之落差，提出獨特的改善建議（李金燕，2013）。因此顧問進行輔導

時，會先請受輔導單位提供先前評核委員建議進行持續改善，過程最後，訓練單位會提供一份自評表，對單位本身先進行資料的檢視及評分，待評核當天將資料提供給評核委員作為參考依據。單位收到評核結果後，訓練單位會發現與期望的分數有落差，對委員的評分依據會感到質疑或顧問是否有幫助到訓練單位做到優化。

廖昭昌（2011）指出，在指標校準的研習活動中，評核委員及輔導顧問同時進行實務操作時，常會有 0.5 分到 1 分的差距；另外彭金山（2016）的研究也指出，輔導顧問與評核委員針對同一單位進行評核，在多數指標上輔導顧問給的評核分數高於評核委員，顯示評核指標雖然有固定的架構，但在顧問及委員各自不同的角色上有不同的看法。在 TTQS 輔導的過程中，顧問給予訓練單位高於預期牌等的鼓勵，在實際經過評核之後，卻發現分數不盡人意。

5.企業機構版對中小企業的挑戰度大

對首次導入 TTQS 人才發展品質管理系統的中小企業來說，除了沒有充足的教育訓練人力外，對於 PDDRO 五大構面的架構知識也相對不足，指標連結上更非一步到位。勞動力發展署在制定版本上，企業除了可申請企業機構版外，依據中小企業認定標準的企業，另有訓練能力檢核表可以申請，其版本效期僅有一年，相較於企業機構版 2 年的效期，則需要每年進行檢核，且檢核次數同一企業單位以申請 2 次為限（勞動力發展署，2021a）。

依勞動力發展署所制定的辦訓能力檢核表，其版本指標檢核為 14 項，評核分數達 50 分即為合格。相較於企業機構版有 19 項指標，且通過門檻須達 53.5 分，兩者在版本上有明顯的差異，且檢核的指標內容也有不同之處。例如：企業機構版指標 17，有 4 項評核的指標內容分別為：反應評估（L1）、學習評估（L2）、行為評估（L3）及成果評估（L4）；辦訓能力檢核表的指標 13，僅針對反應評估及學習評估進行給分（勞動力發展署，2023b）。由此可知，辦訓能力檢核表尚未檢核到經過教育訓練後員工是否為公司帶來的效益，僅針對課程做檢討分析。

中小企業在經歷過 2 次的辦訓能力檢核表後，依勞動力發展署的規定必須進階評核企業機構版，但這中間並無銜接的過渡期，僅能於當年度申請輔導顧問後接著直接進行評核，大多數的企業得到的結果仍是通過門檻且分數不高的狀況。

三、小結

據前述的文獻顯示，企業單位無論是在進行教育訓練上或是正在導入 TTQS 系統時，會發現訓練的過程與結果常無法與 19 項指標連結，主要原因可歸納包括：訓練人員不具備專業能力、訓練成果無法與營運目標連結、利益關係人的參與度不足、訓練資料的不完整等因素，加上 TTQS 本身服務的輔導顧問及評核委員共識差異、版本程度上的差異等因素，都會讓企業單位在申請 TTQS 怯步，2 年效期到期後，便無再次申請的意願。

TTQS 本身的立意是希望透過導入官方的教育訓練系統進行人才培育與發展，可以藉此提升企業服務品質，因此為了增進企業持續改善的動力，勞動力發展署每年會邀請前一年度 TTQS 的金牌單位參加授證儀式及座談分享，希望藉由樹立標竿單位，讓訓練單位有持續向上的動力不斷改善與精進。2018 年的金牌企業表示導入 TTQS 後，減少主管職缺、也增加員工留任，每年節省約 200 萬的人事成本（勞動力發展署，2018）；2019 年另一家金牌企業表示，導入 TTQS 系統已有 6 年的時間，因應時代潮流，不斷照著 TTQS 的精神持續改善，創造高效能學習型組織，提升公司正面形象（勞動力發展署，2019）。根據上述 2 家金牌單位的經驗分享，一致認為 TTQS 對企業有良好的提升獲利與形象效果，從開始導入 TTQS 的困難到最後取得金牌殊榮，從人資部門出發向外擴及其他部門，並成就公司的人才發展。人才是企業最重要的資本，透過教育訓練體系的持續改善與精進，方可確保人才的品質與提升。

肆、以 SWOT-TOWS 分析提出因應策略

一、SWOT 分析

為解決前述所提出在中小企業導入 TTQS 的阻礙及優化改善策略，本段將以「TTQS 人才發展品質管理系統」進行 SWOT 分析態勢，而所謂的 SWOT 分析就是一種透過內外部產業環境分析來進行競爭態勢評估，常用於市場分析、策略擬定的參考（SHOPLINE，2020）。透過 SWOT 策略工具先分析此計畫的內部優勢、劣勢及外部機會、威脅，藉由此分析擬定出往後 TTQS 於中小企業推動的策略。

表 3

TTQS 人才發展品質管理系統 SWOT 分析

內部	
優勢 Strengths	劣勢 Weaknesses
1. 輔導服務及評核服務為免費資源 2. 提供教育訓練基礎實作課程及人資進修的進階課程 3. 由勞動力發展署提供認證，為臺灣目前公認的教育訓練系統	1. 顧問及委員對指標共識上有差異，容易使受評單位期待過高 2. 辦訓能力檢核表僅有 2 次申請機會，與企業機構版無銜接性 3. TTQS 系統無法適合每家企業訓練情況
外部	
機會 Opportunities	威脅 Threats
1. 全國中小企業市場大 2. 可申請人力資源提升計畫並獲勞動力發展署補助 3. 結合勞動力發展署所制定的 iCAP 職能基準，發展職能課程	1. 小人提、聯合型及產業推升型大人提計畫皆不需 TTQS 評核紀錄 2. 企業主動導入 TTQS 動機不高，因補助需要申請才進行 3. 訓練無法有效轉移至工作，進行有效的教育訓練

（一）優勢（Strengths）

1.輔導服務及評核服務為免費資源

依勞動力發展署（2021a）所公布，TTQS 輔導服務及評核服務皆為免費，計畫以年度為計算，每年經費由勞動力發展署全數補助，且當年度接受輔導服務之單位也應接受評核服務，資源上是有限的，因此用罄後不在受理案件。

2.提供教育訓練基礎實作課程及人資進修的進階課程

勞動力發展署也提供訓練單位學習及應用 TTQS 的機會，開設個案解析與實作研習的基礎課程，聘請 TTQS 訓練講師授課，由分區服務中心進行課程規劃及執行，讓企業單位可以派辦訓人員瞭解 TTQS 系統，並實際運用於教育訓練上。顏惠琪（2013）提出利益關係人中，高階主管的教育訓練也依然重要，因此企業若有意導入 TTQS，應公司全體員工都需瞭解系統，進而達到擴散學習的效果。勞動力發展署（2023e）也公布課程地圖，除了基礎實作課程外，另有相關進階課程可供在職進修。

表 4

TTQS 教育訓練地圖

	課程名稱	計畫 Plan	設計 Design	執行 Do	查核 Review	成果 Outcome
專業能力	優化訓練成效與成果展現	✓	✓	✓	✓	✓
	績效管理規劃與導入(iCAP)	✓	✓	✓	✓	✓
	人才發展與組織策略分析	✓	✓	✓	✓	✓
	內部訓練稽核人員	✓	✓	✓	✓	✓
	外部訓練稽核人員	✓	✓	✓	✓	✓
	組織人力策略計劃發展、執行與管控(iCAP)		✓	✓	✓	✓
	教學計畫之設計與發展(iCAP)		✓	✓		
進階能力	TTQS 訓練成效分析	✓	✓	✓	✓	✓
	訓練成效評量設計與發展應用(iCAP)		✓	✓	✓	✓
	工作分析原理與應用	✓	✓	✓		
	員工訓練制度與實務(iCAP)	✓				
	專業訓練人員培訓實務(iCAP)		✓	✓		
	職能導向之招募與選才規劃(iCAP)	✓				
	績效管理執行與員工發展(iCAP)		✓			
	職能導向之甄選與僱用(iCAP)	✓				
	訓練品質優化培訓(iCAP)		✓			
	職場工作指導實務			✓		
	培訓專案管理人員課程(三)(iCAP)				✓	✓
	人力資源規劃與需求分析(iCAP)	✓				
	培訓專案管理人員課程(二)(iCAP)		✓	✓		
	培訓專案管理人員課程(一)(iCAP)	✓	✓			
基礎能力	TTQS 訓練／企業機構版個案解析與實作研習	✓	✓	✓	✓	✓

資料來源：勞動力發展署（2023e）。

　　3.由勞動力發展署提供認證，為臺灣目前公認的教育訓練系統

　　訓練單位評核 TTQS 的牌等證書，為勞動力發展署認證過的證書，目前為臺灣政府所公認的教育訓練品質管理系統，TTQS 證書具有 2 年有效期，可申請勞動部相關計畫補助，例如：企業人力資源提升計畫。

（二）劣勢（Weaknesses）

　　1.顧問及委員對指標共識上有差異，容易使受評單位期待過高

　　承前所述，顧問及委員對於指標上常會有評分上的差距，因此勞動力發展署（2021b）訂定三類專業人員每年需接受指定的職能提升訓練，以達成年度資格。此項規定即顧問及委員

每年的回流訓練，藉此調整兩方面對指標共識上的差異。

2.TTQS 導入會因顧問及委員的見解不同，造成單位無所適從

受評單位因無 TTQS 導入經驗，會藉由輔導顧問的協助來進行，而過去 TTQS 計畫開辦之初並無進行分流，於 2007 年 TTQS 實施輔導顧問及評核委員分流緣故（廖昭昌，2012），顧問則會因個人經驗不同，導入的做法也不同，忽略了企業真正的需求，甚至評核委員也會在評核時推翻掉輔導顧問所提出的概念，使企業無所適從（張仁家、陳錦堂，2017）。

3.辦訓能力檢核表僅有 2 次申請機會，與企業機構版無銜接性

勞動力發展署為使企業在導入 TTQS 這個部分可以持續進步，在辦訓能力檢核表訂定僅申請機會以 2 次為限，如已達次數則要晉升為申請企業機構版。如上所述，中小企業通常因為自身訓練條件不足的情況下，改評核版本，分數總不盡理想。

（三）機會（Opportunities）

1.全國中小企業市場大

根據中小企業署《2022 年中小企業白皮書》所公布，2021 年臺灣企業總家數達 159 萬5,828 家，其中中小企業占臺灣全體企業 98.92%，臺灣以中小企業為主要的企業規模，在 TTQS 導入的部分是有很大的市場。

2.可申請人力資源提升計畫並獲勞動力發展署補助

勞動力發展署為了協助企業單位辦理勞工在職進修，特別提供「企業人力資源提升計畫」這項補助計畫，讓企業在辦理教育訓練時，可以更有效的投資人力資本。

3.結合勞動力發展署所制定的 iCAP 職能基準，發展職能課程

iCAP 職能發展應用為中央主管機關所訂定的職能基準，此項基準係依據「職業訓練法」（勞動力發展署，2022）。通過 TTQS 以後，可以結合 iCAP 的職能資源，將課程設計為職能導向課程，使企業可設計出更貼近真正需要的課程。

（四）威脅（Threats）

1.小人提、聯合型及產業推升型大人提計畫皆不需 TTQS 評核紀錄

承前所述，根據勞動力發展署 2023 年的規定，小人提、聯合型及產業推升型大人提計畫，

皆不需要進行 TTQS 為申請紀錄或核銷的要件。誘因或強制的力道因此減少，使得 TTQS 在企業單位推動困難度大幅提升。

2.企業主動導入 TTQS 動機不高，因補助需要申請才進行

勞動力發展署（2023d）的規定，個別型人力提升計畫在提交申請時，需要有 TTQS 評核紀錄，如為第一次申請的單位，則需要當年度有評核過的紀錄為核銷要件。依筆者的觀察，新申請人提計畫的單位大多會詢問 TTQS 的準備資料事項，詢問目的皆不是因為公司要導入為目的，僅是因為核銷需求。但目前大人提僅有這個類別有這項規定，若未來持續放寬規定，更大大減少了申請的誘因。

3.訓練無法有效轉移至工作，進行有效的教育訓練

承上述，辦理教育訓練最終的目的是希望可以應用於職場，會訂定所謂的學習移轉機制。因企業辦理教育訓練由主管下達指令進行課程，沒有從根本瞭解企業所需要提升的能力，在學習移轉機制的執行上，有些困難度。

二、TOWS 矩陣策略分析

陳德展（2011）表示 SWOT 轉變成 TOWS 的矩陣策略的過程，從內部分析角度轉變為外部分析角度，且更符合情境分析的策略規劃工具，TOWS 矩陣策略（Threats-Opportunities-Weaknesses-Strengths Matrix）是一種概念模型，分析外部環境的機會及威脅及本身所具有的優勢及劣勢，藉以發展出有效的策略（巫璧盈，2012）。本研究先以 SWOT 分析 TTQS 在企業推動的內外部影響之後，再結合內外部分析擬定對應策略，如表 4 所示，分別為：進攻策略（SO）、改善策略（WO）、緩衝策略（ST）、保守策略（WT）。

表 5

TTQS 於中小企業推動的 TOWS 矩陣策略分析

		內部	
		優勢 S	劣勢 W
內部 策略 外部		S1.輔導服務及評核服務為免費資源 S2.提供教育訓練基礎實作課程及人資進修的進階課程 S3.由勞動力發展署提供認證，為臺灣目前公認的教育訓練系統	W1.顧問及委員對指標共識上有差異，容易使受評單位期待過高 W2.TTQS 導入會因顧問及委員的見解不同，造成單位無所適從 W3.辦訓能力檢核表僅有 2 次申請機會，與企業機構版無銜接性
外部	機會 O	進攻策略 SO	改善策略 WO
	O1.全國中小企業市場大 O2.可申請人力資源提升計畫並獲勞動力發展署補助 O3.結合勞動力發展署所制定的 iCAP 職能基準，發展職能課程	S1O1.在科學園區或工業區舉辦業務說明會、講座推廣 S3O2O3.由勞動力發展署舉辦企業教育訓練計畫聯合說明會	W3O1O2.針對中小企業放寬辦訓能力檢核表的申請次數
	威脅 T	緩衝策略 ST	保守策略 WT
	T1.小人提、聯合型及產業推升型大人提計畫皆不需 TTQS 評核紀錄 T2.企業主動導入 TTQS 動機不高，因補助需要申請才進行 T3.訓練無法有效轉移至工作，進行有效的教育訓練	S1T1.增加申請 TTQS 的誘因 S2T3.將個案解析與實作研習班課程時間拉長 S3T1.將相關計畫重新研擬，以符合現行計畫規定	W3T3.中小企業先進行辦訓能力檢核表

二、資料處理與分析

（一）訪談資料之編碼分析

　　為求研究結果完整，每個研究目的不僅由一位研究對象回答，而是皆由兩位研究對象回答後再進行統整。訪談結束後依訪談錄音檔及研究者筆記完成逐字稿，研究者將逐字稿中回應研究問題的概念、實際做法與看法態度等依照訪談對象編號進行編碼分類，表 2 為訪談資料對應研究目的後的編碼及分類原則。最後以研究者、訪談者及科技教育專家學者的三方觀

點進行三角驗證，確認訪談資料的編碼與分類正確無誤。

表 2

訪談資料對應研究目的之編碼及整理原則

訪談對象編號	對應之研究目的	研究結果分析重點
A、B	目的一（教學工作）	(1)課程的規劃與設計 (2)課程中進行的教學 (3)評量 (4)生活科技教室的班級經營 (5)生活科技教室的管理 (6)維持教學專業能力
B、C	目的二（行政工作）	(1)生活科技教室的規劃 (2)科技領域之相關計畫 (3)公開觀課 (4)擔任領域召集人或科目召集人 (5)擔任行政組長
A、C	目的三（研究工作）	(1)行動研究及教案競賽 (2)帶隊競賽 (3)提升教學成效 (4)設計多元評量 (5)融入教學科技
編碼原則：訪談對象-對應之研究目的-研究結果分析重點-概念（-子概念）		

（二）信效度及研究倫理

　　為確保訪談內容效度，研究者在設計訪談問題時除了彙整相關資料外，也邀請國內科技教育學者確認訪談問題與研究目的之對應關聯性，並進行多次的討論與修正。此外，研究者於訪談前一週寄訪談大綱給訪談對象，確保其對研究有初步了解，回應更全面且經思量，以提升研究效度。訪談完畢後研究者將整理過的逐字稿再次寄給訪談對象參閱，以確保逐字稿內容與研究對象要表達的概念相同無誤，藉以確保訪談結果的信度。整理結果發現，三位訪談對象重複提及各項工作內容，確保收集到的研究結果全面性地包含了生活科技教師的真實工作內容。此外，本研究謹守研究倫理，對於訪談對象的個人資料絕對保密，並在逐字稿中關於訪談對象的身分、服務機構等相關經歷以匿名處理之。

伍、結果與討論

一、十二年國教國中生活科技教師之教學工作

　　教學工作的定義為所有與指導學生相關的工作，為生活科技教師例行性的每日工作內容，且教學對象為該教師教授班級中的每一位學生，工作時段包含課前、課中、課後的準備與進行，授課內容為符合十二年國教國中生活科技課程綱要的教科書課程、自編課程等。與前述文獻探討不同的是，教師指導學生參加競賽之工作不包含在此，因參加競賽的學生僅為少數族群，指導的內容也較一般課程更加深加廣，因此歸類於研究工作中，將於「三、十二年國教國中生活科技教師之研究工作」中進行深入討論。

（一）課程的規劃與設計

1.教學流程的規劃

　　生活科技課程往往需要多週時間進行，教師應從學期初就妥善安排每個授課班級的整學期進度規劃。

> 教師必須確保教學過程的流暢性，所以要做全面性的規劃。像是段考間有幾週、幾節課，要教什麼教學內容，該如何分配節次與進度。(A-1-1-1-1)

　　生活科技課程每週僅授課一次的特性讓課程進度的彈性降低，在實務面上很可能遇到國定連假、段考、校外教學等而導致某些班級的上課週數大幅減少，教師必須提早知悉並妥善規劃，確保課程結束時讓九成以上的學生都足以完成作業、完善整個學習歷程。

2.實際試做課程活動

　　教師應在正式授課前將該課程的活動完整實作至少一次，親自經歷學生的學習歷程，以妥善分配課程進度。

> 要教學生做東西之前自己至少要先試做過才有辦法教，才知道整個製作過程、流程要如何帶給學生，也可以妥善抓好時間。(B-1-1-2)

在試做中規畫有利於學生加工的製作過程，甚至需要考慮教室設備數量是否會供不應求，避免學生浪費許多時間在排隊，這時教師可以安排其他工作同時進行，確保進度不要延滯、減少排隊現象。試做中也能發現實作課程的應注意之處、可能受傷之處，在教學時加強提醒學生，減少受傷事故發生。

3.課程包準備

課程所需用到的所有資料、材料、設備等，在課前準備完成，包含授課簡報或板書內容、自製講義或學習單、教學材料採購與備料、教學及加工所需之工具與機具清點、採購與維護等。

設計整個課程會用到的講義、簡報、學習單等。(B-1-1-3-1)

教學材料及設備的採購。(C-1-1-3-2)

4.評分方式的訂定

需依據學生的能力及預計的教學進度來規劃，訂定評分方式可以參考教科書的建議，但教師仍需有能力隨時調整。

教師可以參考課本提供的評量方式，但有時還是需要根據學生的能力或教學進度等其他因素，需有能力自行調整評分方式，讓其適合學生的現況。(A-1-1-4)

訪談對象亦表示近年來學生的手作能力有些微下降，同樣的內容需要花更多時間才能完成，這就是教師需要注意且進行調整的部分。

5.課程調整與修正

教師應就自己所觀察到的及學生呈現的內容對課程進行改良或修正。

課程全部完畢後，會調整課程或流程使其更順暢，也會調整簡報，跟同事分享各班的教學情況，找到更好的方式教學。(B-1-1-5)

無論教師的教學經驗是否豐富，每屆面對的學生仍然不同。如加工流程的順序安排，或許可以縮短學生的加工等待時間、減少製作錯誤或受傷的原因等，再如授課簡報也可依據學生的反應進行調整，標示更加清楚、貼近學生認知。

6.其他（使用自編教材者）

教師務必於課前確認自編教材符合十二年國教課綱的範疇，也因此可能有額外的教學工作。

確實有很多生活科技教師會用自己的教材，那麼這位生活科技教師可能會有額外的教學工作。(A-1-1-6-1)

要確保自編教材符合課綱。(A-1-1-6-2)

在十二年國教上路前，有許多資深教師已有應用多年的課程與教材，也確實有許多教師目前仍繼續使用自編教材或九年一貫時期的課程，不過若仍持續使用這些教材在十二年國教下進行授課，教師務必於課前確認這些教材符合十二年國教課綱，如將課程目標、學習內容及學習表現等參考指標與課綱進行比對確認。

（二）課程中進行的教學

課程中進行的教學包含三項，分別為知識性內容的呈現、操作性的作業演示以及學生疑難的排解。

課程中的教學就是知識性的內容呈現(B-1-1-2-1)

以及操作性的作業(B-1-1-2-2)，看是透過示範還是學生的練習。

學生有任何的疑難或問題，教師要用示範還是講述去解答？這些都是在課中教學很重要的部分。(B-1-1-2-3)

呈現教材中知識性的內容，如科技系統的簡介、科技發展的起源與演進等，可以配合教科書或學習單做討論與介紹。操作性的作業包含工具及機具的示範、加工方式與技巧的演示，大多數教師使用現場示範教學，也有些教師錄製影片供學生課前預習，可以避免學生圍繞在教師身邊觀看的擁擠或困難。學生的疑難排解包括前述兩者在講解或示範時學生的提問，以及學生在製作作品時碰到的困難與疑惑，甚至是加工失敗、製作錯誤時的補救措施等。

（三）評量

評量工作會因多元評量的方式而有所不同，生活科技課程常使用實作評量及檔案評量。

生活科技教師常會被家長質疑成績太過主觀，所以以我們學校來說，除了較有標準性的測試、測量成績，我們還會加上筆試，將紙筆測驗放在定考分數中。(B-1-3-3)

實作評量包含課程中進行的作品實測成績、作品評分等；檔案評量則是學習單或歷程紀錄表等作業，包含設計圖、製作歷程、小組討論等。以上兩種評量方式可兼顧學生實作課程的過程及結果，然而評分依據都較主觀，教師可視情況增加紙筆評量於定期評量筆試中，實作評量則是增加有標準性的測試條件與規則，確保學期成績的標準性與客觀性。

（四）生活科技教室的班級經營

生活科技課程的進行方式與原班教室教學有諸多不同，教師需要教導學生共同維護生活科技教室空間的安全與衛生。

生科課上學生不會乖乖坐在座位，他會站起來走來走去，所以在班級經營這塊，常規的

課堂要求就很重要。(B-1-4-1)

教室中機器跟工具的教學使用及安全要求規範。(B-1-4-2)

學生在生活科技教室中不時需要起身加工、拿取工具或進行討論等，這與在原班教室授課有很大的差異，同時生活科技教學更多是動態的機具示範、工具操作，這時班上秩序就需要教師特別注意與拿捏。此外，教室中所有的機具設備及工具的使用、擺設、安全規範也很重要，不當使用或嬉鬧都可能發生受傷事故。

（五）生活科技教室的管理

使用教室內的機具需要具備操作知識，不可讓一般學生或其他教師皆可隨意出入。

我們會在專科教室上課而非一般教室，管理生科教室是每個生活科技教師都無法避免的。(A-1-5-1)

生活科技教室中要有材料區、廢料區的規劃。(C-1-5-6)

生活科技教室的人員需要有進出管控，因應新課綱的資訊融入教學及跨領域整合課程，生活科技科以外的他科課程也有可能會借用生活科技教室的機具設備，當他科教師也想使用教室資源時，設備器材借用的管控也是生活科技教師的管理範疇。而工具設備的維護與保養，在學期開始前教師通常需要先到生活科技教室確認機具的狀況及打掃教室，授課階段也需規畫教室內空間規劃，如加工區、材料區、短料區等。

（六）維持教學專業能力

教師必須理解十二年國教的重要內涵，更應對於課綱訂定的學科知識內容保持精熟。

製作輔具或教材幫助學生提升學習成效，紙本的、實體的、多媒體的、虛擬的方式都可以。(A-1-6-3)

我覺得多參加各單位辦理的各式研習，可以有新的點子去規劃課程。(B-1-6-4)

網路自學這塊我覺得蠻重要的,國內外的影片甚至是網紅的影片我覺得都有參考的價值。

(B-1-6-5)

　　符應十二年國教「終身學習」的精神，科技領域的生活科技教師應與時俱進，也同林弘昌、陳彥綸（2019）研究結果指出，生活科技教師需參加增能課程或網路自學，提升自我專業能力。此外教師應致力於提升學生的學習動機與學習成效，如在課程中製作輔具或教材來幫助學生更易於理解，或是製作加工治具以利學生操作，也可以應用多媒體教材，拍攝機具操作影片等。

二、十二年國教國中生活科技教師之行政（服務）工作

　　行政（服務）工作的定義為生活科技教師在非擔任正式行政職時，可能需要參與或處理的行政業務，或許與學生及教學並無直接交集，卻有著極大的關聯，同時也與十二年國教密不可分，這些行政（服務）工作有可能出於自願或非自願（指派）的形式。此外，亦探討身為生活科技教師較可能擔任的正式行政職位。

（一）生活科技教室的規劃

　　儘管生活科技教師未擔任行政職位，仍需要積極參與生活科技教室的規劃與建置。生活科技教師對於採購的機具與設備之廠牌規格等資訊應有所了解，以免採購錯誤而損失經費。

教師會與設計師共同規劃教室的空間如何安排，包括桌椅擺放、櫃子、教室上課動線、安全等。(B-2-1-1)

電源（配線）的規劃與了解，電源的規劃很重要，還會牽涉到總務處。(C-2-1-5)

教師可能要詢問別人創課教室要做什麼？或是心中要有課程規劃，才能做這間教室，不能買到教師自己根本不會使用的機器設備。(C-2-1-6)

建置一間生活科技教室時，需要生活科技教師的專業與意見，避免全權讓非生活科技專

業的同仁安排，例如與設計師討論教室空間的規劃、關注教室建置工作的情形。此外，在規劃生活科技教室前建議教師也應規劃課程，在課程的需求下增購或建置一間適用的生活科技教室，這些工作內容與《教育部國民及學前教育署補助國民中學與國民小學推動十二年國民基本教育科技領域課程作業要點》中所提及的內容相同。此外，在執行這些工作時還會與校內其他行政單位有關，例如與教務處、總務處同仁的溝通協調。

與前述生活科技教室管理差異之處為「規劃」與「管理」的定義，在本研究中生活科技教室的「規劃」意指該校原本沒有生活科技教室或僅有空間而尚待建置，教師幾乎是從零開始建置；而生活科技教室的「管理」意旨該校的生活科技教室已建置完畢，基礎的工具設備及教室環境已備妥，僅需教師日常的管理及維持。

（二）科技領域之相關計畫

學校的經費來源與承接專案計畫兩者密不可分，需要校內同仁爭取承接計畫，而相關計畫有些為競爭型計畫，有些則為指派型任務，以下是一些訪談的佐證資料。

競爭型計畫，現在因為資源有限，由各校自行爭取。(C-2-2-1)

也有可能是教務部指派某項計畫或任務給校長，像是作前導學校、試辦學校。(C-2-2-2)

教育部活化計畫，是社群、分組合作學習的計畫，每個學校幾乎都有，底下還有四五個子計畫。(C-2-2-3)

科技中心的子三計劃有兩種，有教師來上課或是經費給學校自己上課買材料再提供教案給科技中心，然後把收據給科技中心核銷，以及成果、課程敘述或照片紀錄等。(C-2-2-4)

過去資源較豐沛的草創時期常見到的是指派型任務，如某些學校被欽點為「前導學校」或「試辦學校」，教師需要承接計畫工作，這與賴榮飛（2017）在「科技領域的課程推動與配套規劃」中所提及的資訊相同；現在逐漸變成競爭型計畫，需要教師或行政職積極爭取才有經費。目前各校較常見的是配合科技中心的子三計畫或競賽承辦等，還有不分科皆有可能承辦的教育部活化計畫、合作學習計畫等。

（三）公開觀課

公開觀課的內容包含課前共同規劃課程、課中實際參與觀課、課後研討教學成果及給予專業回饋。

最近這幾年都需要公開觀課。(B-2-3-1)

依據《國民中學與國民小學實施校長及教師公開授課參考原則》，國民中小學之校長、專任教師、兼任行政職務之專任教師、代理教師等，每學年皆應公開授課至少一次。

(四)擔任領域召集人或科目召集人

領域召集人或科目召集人的工作內容廣泛，且依各校情形有所差異，主要包含教學研究會、校內會議、領域課程計畫撰寫等。

生活科技的課程設計計畫撰寫，比如說整學年度的或是各年級的課程設計的計畫撰寫，與教學非常有關係。(C-2-4-4)

可能還有國際教育（海外筆友、海外姊妹校活動），或新興科技的課程教育（元宇宙、AR、VR、XR），或永續發展目標 SDGs 的相關課務（目前很多學校在做），以上皆包含研習溝通、工作規劃、經費採購及核銷等。(C-2-4-7)

教學研究會之相關業務如安排領域研習課程、舉辦領域會議；參與校內會議如課程發展委員會會議、教師評選會議；撰寫生活科技課程計畫包含各年級的課程設計，或指派領域下其他教師呈交課程計畫；撰寫科技領域的經費或計畫，雖然並非正式行政職，但生活科技的專業內容仍需生活科技教師參與；傳達行政訊息給該科教師群，如線上課程實施、校務事項。此外，依各校情況不同，有可能因應學校轉型為雙語學校而設計雙語課程，或其他彈性課程如跨科或跨領域的活動、新興科技教育，甚至是國際教育、永續發展目標(Sustainable

Development Goals, SDGs)等的相關業務，包含研習課程規劃、經費運用及採購等。

（五）擔任行政組長

　　生活科技教師較可能擔任的正式行政職為教務處設備組長及資訊組長，當然亦有許多擔任其他行政職的機會。

　　我覺得生活科技教師比較容易接到的行政工作就是設備組跟資訊組。(B-2-5-1)

　　秉持著熱誠、積極想解決的態度，態度蠻重要的。(C-2-5-4)

　　跟導師的溝通，很多時候處理事情時需要導師跟學生傳達，導師是你的助力。(C-4-6)

　　與家長的溝通。行政有時候會直接對到家長，要換位思考幫家長想，用對方的角度來做事情。(C-2-5-7)

　　擔任行政職應秉持熱誠與積極的態度，運用適當的溝通方式與校內各行政單位合作，並學習公文書的寫作，例如上簽呈、寫計畫、爭取並運用經費；也需要與導師及家長溝通，透過導師來聯繫親師生，例如教室管理、教科書發放；有時行政職會直接與家長對接，例如發通知給家長或家長致電，需要理解家長的需求。

三、十二年國教國中生活科技教師之研究工作

　　研究工作的定義為生活科技教師為增進教學專業能力或配合學校整體發展而進行的工作，以及擔任指導部分學生更加優秀、參賽競爭的專業指導者，為符合實務所需教師可能需要進行加深加廣的學習及研究，這些研究工作可能出於自願或非自願（指派）的形式，也可能需要花費教師課餘或自由時間來將其完成。

（一）行動研究及教案競賽

　　參加行動研究和教案競賽是目前生活科技教師很重要的研究工作之一。

　　以台北市的學校來講，行動研究是一件重要的事情，你可能每年都要參加，或是隔一年

就要參加。(C-3-1-1)

　　教師可能經由參加教師行動研究相關社群，或是為達成長官的工作期望，亦或是因自身興趣而從事行動研究。包含各縣市的教學行動研究徵件，如「臺北市教育專業創新及行動研究徵件」，依學校狀況參加的頻率有所不同。此外還有其他教案比賽，例如親子天下的創新教案、教育部教案徵件、教學卓越競賽等。

（二）帶隊競賽

　　與三位訪談對象深入討論後發現，三位皆不認同帶隊競賽應被歸類於教學工作中，由於競賽指導的內容大多超出平時所教授的範圍，多為加深加廣的知識與技術應用，且指導對象為特定一小部分學生，並非普及的教學。一位訪談對象認為應將其歸類為獨立工作、兩位訪談對象認為適合歸類於研究工作，有鑑於此，研究者將帶隊競賽從原先的「教學工作」項目中移除，移至「研究工作」中深入討論。

　　我覺得競賽較適合歸類在研究工作，不是每個教師都一定會帶到比賽，教學對象又是比較小部分的學生。(A-3-2-1)
　　我覺得競賽工作是獨立出來的，以生活科技教師來講很像理化教師帶科展，它不是生活科技教師整個教學的工作之一，比較像是外加工作，但也不算是行政工作。(B-3-2-10)
　　競賽真的蠻複雜的，要找時間、要找人、要有材料、有工具，要花額外的時間，所以競賽是可以歸類在研究。(C-3-2-15)

1.提升自我專業能力

　　教師可能為了指導競賽而參加額外的增能課程，或自行鑽研十二年國教課程以外的知識與技術，學習管道除了參與研習外，還有網路自學或競賽觀摩等。

　　不是每個教師都能做到，會需要參加研習增長專業能力。(A-3-2-2)

我會去其他縣市觀摩，會知道比賽過程評審關注什麼，回來後我不會直接跟學生說，但我會用引導或提示的方式讓學生思考。(B-3-2-6)

指導競賽與平時授課的教學方式不同，訪談對象在指導競賽時多使用旁敲側擊的方式，而非直接公布最佳方案或口令式教學，在訓練期間養成學生獨立思考的習慣，學生方有解決比賽突發狀況的能力。

2.指導與陪伴學生

指導競賽的教師是非常辛苦的，需要利用課餘或下班時間陪伴學生。

可能需要幫學生規畫準備競賽的內容、時間及進程等。(B-3-2-4)

要花時間陪伴學生，或是指導，依照學生的能力有區別。(B-3-2-3)

競賽結束後可能會舉辦類似慶功宴、出去吃飯的活動安排，讓學生有個完美的 ending。
(B-3-2-9)

教師需要帶學生一同規劃備賽進度，讓學生了解自己該做什麼。每屆學生資質不同，儘管是指導競賽已有多年經驗的教師，也需要重新認識選手的能力。若是大校，教師可能會同時訓練兩、三隊選手，互相觀摩學習，建立學生的榮譽感及信心、提高參與度。競賽後無論是否得獎，教師都應給予適切的鼓勵與建議。

3.參與競賽之相關準備工作

參與競賽的相關工作包含許多繁瑣的內容如下。

在平常生科課時就尋找能參賽的選手。(B-3-2-5)

生科教師也要考慮到前去參賽的路程安全性，同縣市內的競賽可能還好，如果要跨縣市的話就要多注意。(B-3-2-7)

也有可能需要跟家長溝通，像是寫同意書等比較細節瑣碎的東西。(C-3-2-14)

經費核銷，例如材料工具採購、車馬費。(C-3-2-13)

　　首先，教師須於平時教學工作中觀察並選拔選手或鼓勵學生參賽；其次，教師需要考慮學生前往競賽的路程安全性，縣市內的競賽通勤較為方便，但全國性的競賽則需要跨縣市移動；其三，學生需要花許多額外時間訓練，參加競賽更是要到不同場地，要與家長有明確告知及良好溝通；其四，在準備競賽的材料與工具上，也會有經費核銷、請款等的行政作業需要完成。

（三）提升學習成效

　　包含教材的研發與更新，讓新興的知識融入教學中，以及調整教學方法以促進學生的學習成效，如翻轉式教學、異質性分組等，教師成為陪伴者與引導者的角色。

教學方法的改良，例如嘗試翻轉教學搭配異質性分組。(A-3-3-2)

教學教材跟十二年國教學習重點的課程轉化，包含教學策略、差異化教學、特殊學生的教學策略或輔具。(C-3-3-4)

　　比如十二年國教才普及的雷射切割或 3D 列印的應用課程，以及十二年國教下的木工設計課程更加注重問題解決或創意設計，而非強調學生在製作作品的技藝精熟程度，需轉化舊有課程內容，以符應十二年國教新課綱的教學理念與目標，這與林弘昌、陳彥綸（2019）的研究結果相同，生活科技教師會藉由參與教師專業成長社群或其他管道，提升自己教學的專業，促進學生的學習成效。

（四）設計多元評量

　　使評量方式更加多元，評量結果更趨客觀。

包含學習歷程心得簡報報告、學習單（按照教師想教的東西，逐步的引導或學習線索）、口頭問答、總結性的作品展示。(C-3-4-1)

線上評量。(C-3-4-2)

混成評量，例如簡報報告、歷程錄影等。(C-3-4-3)

過去生活科技課程的評量多為作品評分，為讓評量不再限於作品的成績，需增加包含歷程性的紀錄與紙筆評量，如學習心得、歷程簡報等，以及口頭問答、作品展示分享。因應多變的生活環境及實際需要，教師也需設計線上評量、混成評量，如作品及製作歷程的拍照或錄影、線上表單等，隨時調整評量方式以滿足現況所需。

（五）融入教學科技

因應十二年國教及日新月異的科技進步，資訊融入教學成為各科教學的趨勢，教師需要主動使用數位工具與其相應之教學策略將教學科技整合於課程中。

融入多媒體及數位工具於教學。(A-3-5-1)

融入教學科技更多的是提供學生在課程中一個新的工具與媒介，其目的同樣是為增進學生的學習成效、幫助解決問題，用以支援或延伸課程的目標。

陸、結論與建議

本研究的目的在探討十二年國教下國中生活科技教師的工作內容，經彙整相關文獻資料與訪談內容後，提出以下的結論與建議：

一、結論

（一）十二年國教國中生活科技教師之教學工作包括課程的規劃與執行、評量、班級經營、教室管理及維持教學專業能力

詳細的工作項目為「課程的規劃與設計」、「課程中進行的教學」、「評量」、「生活科技教

室的班級經營」、「生活科技教室的管理」、「維持教學專業能力」六項主題，包含與指導學生有關的所有工作細項，且需符合十二年國教新課綱所訂定之精神與原則。

（二）十二年國教國中生活科技教師之行政（服務）工作包括規劃生活科技教室、參與科技領域相關計畫及執行學校校務行政工作

詳細的工作項目為「生活科技教室的規劃」、「科技領域之相關計畫」、「公開觀課」、「擔任領域召集人或科目召集人」、「擔任行政組長（設備／資訊組長等）」五項主題，除了後面兩者之外，大多為因應十二年國教下所產生的新工作內容。

（三）十二年國教國中生活科技教師之研究工作包含參與行動研究及教案競賽、帶隊競賽及其他能促進教學成效之研究工作

詳細的工作項目為「行動研究及教案競賽」、「帶隊競賽」、「提升教學成效」、「設計多元評量」、「融入教學科技」五項主題，這些工作看似與過去相同，然而在十二年國教下，其詳細內容已經有所增加與改變。

二、建議

（一）科技領域教師需更注重終身學習以增進科技新知

科技本身即是日新月異的，這是科技領域教師與他科教師的最大差異之處，生活科技的教材內容可能每隔幾年就會更新，換言之教師必須更注重終身學習的精神，因此建議生活科技教師參與研習課程或透過網路自學等方式，不斷汲取新知，拓展並維持自身的專業能力。

（二）生活科技教師應主動參與生活科技教室的規劃修繕及採購設備

課程是教師規劃的，教師也最了解自己的能力，教室的規劃與設備採購生活科技教師務必要主動參與，切勿因為自身非行政職，就讓學校處理修繕或採購相關業務的同仁全權處理，否則建置完成的教室與採購的設備非教師真正需要的，對教學幫助有限也浪費寶貴經費。例如教師要提供工具設備的規格，方便總務處的採購，以免採購錯誤。

（三）生活科技教師在指導競賽時應多以引導方式訓練參賽學生

近年科技領域的相關競賽眾多，不少生活科技教師被賦予指導學生參加競賽的工作。雖然模仿或復刻教師的作品是一個速成的訓練方式，但引導的方式能讓學生學習到更多，且在十二年國教下的生活科技更加注重學生「問題解決」的能力，競賽也將此做為學生的挑戰，

在獨自面對比賽當下需有能力解決練習時不曾出現過的突發狀況，這也是最後能否在競賽中脫穎而出的關鍵因素。

（四）十二年國教下生活科技教師應重視調整教材的能力

對於大部分的生活科技教師來說，獨自研發教材並非首要且必要的能力，能夠調整課程並忠實地呈現課綱精神才是首要能力。當教師參加增能培訓或研習課程後，應能夠將這項增能課程調整至適合該校實行，教師需要考慮自身專業能力是否已充足、學校的客觀環境及設備是否完善、是否滿足該校學生的學習動機及需求等，未必馬上就要開始著手研發新教材，而是教師要有能夠調整教材的能力才是關鍵。

三、研究限制

本研究之研究對象不僅有生活科技教師，還有生活科技本科出身的主任及校長，包含教師的上級長官作為研究對象是為得到更加全面而實務的研究結果，但也可能由於研究對象現職的工作崗位與身分，而對生活科技教師一職的工作內容有其他的要求與期待，是為本研究之研究限制。

未來的研究建議可以對生活科技教師及生活科技教師之上級長官，分別訪談數位後再進行結果的比較與探究；或是限縮調查範圍，僅針對某些特定地區或有其他身分的生活科技教師進行工作內容的調查，例如偏鄉教師、生活科技雙語教師等。

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