Taking Taiwan to the world: A flipped classroom approach to teaching English in Taiwanese and digital contexts

Ching-Wen Wang

The Language Center, Chaoyang University of Technology, Taichung, ROC, Taiwan.

Abstract To counter traditional teacher-centered classes, Taiwanese educators are advancing innovative methods of teaching English. This study compared a control group with an experimental group that experienced a flipped classroom approach, using digital content and in-class activities. The content for both groups included pronunciation, vocabulary, and sentence patterns, in addition to a major project, Taking Taiwan to the World, which used the Postcrossing web app. The results were statistically significant, demonstrating that the flipped classroom reduced learning anxiety, while increasing learning interest and effectiveness, as well as overall higher academic achievement.

Keywords: CLIL, ESL, flipped classroom, postcrossing, Project-Based Learning

1. Introduction

Taiwanese students take the required English classes for at least 10 years before entering college, where they will continue taking both the required and elective English courses. However, the pressure on students to excel on examinations so that they can proceed from one level of schooling to the next has turned the study of English away from both its cultural and practical values as a second language toward becoming merely another subject leading to yet another examination.

A consequence of this traditional teach-and-test orientation is the dearth of learner-centered classes. English teachers train to deliver a closed set of information rather than innovate on the kinds of formative learning simulations that develop a student’s ability to apply the language in real life. As a result, most students scarcely learn to express, discuss, or debate ideas in English. Instead, they simply record key examination points, but their ability to apply any learned information in real life remains unknown.

In response to these diminishing outcomes, the rigid traditional framework of second language (L2) teaching has been established, and English teachers and second language acquisition (SLA) scholars in Taiwan have been discussing ways to incorporate innovative teaching methods that refocus students’ learning outlook through the design of novel classroom activities. Project-based learning (PBL), content and language integrated learning (CLIL), and flipped classroom teaching (FC) are all meant to fulfill these two goals. Naturally, each approach has advantages and disadvantages that may or may not make it suitable for a topic or a class. Moreover, having various approaches at the ready offers teachers flexibility while still working in the traditional classroom setting (Chen, 2019). In addition, every teaching innovation necessitates a revision of the prevalent methods of assessment to improve learning effectiveness.

1.1. Project-based learning

PBLs use problem solving activities to train students in creative and critical thinking abilities (Bolsunovskaya et al., 2015; Yen, 2015). This approach enhances the acquisition of knowledge through communication, teamwork, and independent learning, which together constitute the concept of integrated learning. The process involves the teacher first designing learning problems or situations around a particular topic and then defining for the class any related special terminology. Following these preparations, the students are divided into groups, and the problems they are trying to solve are identified.

Through discussion, each group sets a goal and pursues a solution, which often involves collecting data and/or conducting research. The teacher guides the groups’ progress by coaching their process, such as ensuring that discussions follow a path toward the teacher’s predetermined learning objectives. However, the teacher does not think for the group, such as by making their decisions or suggesting possible choices.
1.2. Content- and language-integrated learning

CLIL also involves the teacher in designing classroom activities, a dual-focus process that regards subject content and language learning as a single integrated learning experience (Coyle et al., 2010). The teacher formulates an activity and designs it according to a 4C framework, which includes content, communication, cognition, and culture. Content refers to subject knowledge, while communication is the integration of language learning or the language of learning. Cognition employs students’ higher-order thinking skills (HOTS) in learning activities and involves cultural values that foster an awareness or knowledge of both their own and other cultures (Meyer, 2013). Culturally speaking, the greater aim of CLIL is to develop students’ sense of global citizenship.

1.3. The flipped classroom

Flipped classroom teaching is more common in higher education settings than in secondary education settings. While it involves the conversion of teaching content into online material, it also falls into the category of blended learning by combining online material with classroom interaction, such as either PBL or CLIL activities. These carefully designed learner-centered interactions enhance learning outcomes while strengthening students' understanding of the subject.

Although the fundamental purpose of the FC is to gain more time in the classroom for these valuable learning activities, the approach also requires students to think about the material prior to engaging with it in class activities and discussions. Thus, learning depends upon students engaging with online material before going to class as preparation to participate effectively in learning activities (Reidsema et al., 2017).

Flipped classrooms center on the students (Ozdamlı & Asıksoy, 2016) by reversing the learning experience from lessons and homework to online presentations followed by classroom learning activities. Likewise, teaching has shifted away from traditional subject narration toward guided learning, with students working cooperatively during class by participating in discussions and learning activities. Thus, the FC strategy not only promotes independent learning but also encourages mutual guidance between students (Zhang, 2018).

Zhang (2018) explored the effects of using FC teaching with college English learners by factor analyzing responses from 202 questionnaires. They found that college students in the FCs had significant autonomous cooperative learning experience. They also manage difficulties through persistent focused learning. When students engage in these four learning behaviors—autonomy, cooperation, persistence, and focus—they are more likely to create their own learning opportunities. In addition, the FC raised students’ academic performance by affording them the opportunity to seek timely help from their peers and teachers.

2. Purpose of the study

This study examined the benefits of combining the essential features of PBL and CLIL in an FC setup. It also explores whether developing and providing teaching and learning materials for digital dissemination truly provides teachers with more time to conduct learning activities in the classroom. Using PBL as one type of activity provides an important mode of learning through discussion, including topic selection and the assignment of roles for each group member. Along with the 4Cs and HOTS, CLIL’s dual-focus activity model intensifies the students’ overall learning experiences.

The teaching objective in the study concerned preparing students to use English in real-life communication rather than treating it as a subject for examination. However, the content of commercial English textbooks is, by necessity, generic; that is, teaching examples primarily concern English-speaking rather than Asian cultures. Consequently, they do not immediately relate English to the real lives of Taiwanese students. As a result, even though English is a major subject at every stage of a Taiwanese student’s education, students still cannot imagine using it for anything immediate, other than occasional meetings with a foreign tourist or if they happen to travel overseas. In addition, their English textbooks, which seem more interested in marketing themselves than in teaching English, may create an extraneous cognitive load that negatively influences learning (Sweller et al., 2011).

In addition, spending so much time preparing for their English examinations leaves students insufficient time to explore or understand the language within the context of their own culture or history, which in turn diminishes their ability to develop their knowledge of English as a second language, which results from their use of English to understand and express themselves, their Taiwanese identity. Furthermore, linking the students’ English curriculum to preparing for comprehensive examinations while including some theoretical textbook values, such as how to conduct an international business meeting, represses rather than enhances a sense of immediacy about the subject, thereby weakening their enthusiasm for learning. Hence, this study intended to overcome these curricular shortcomings by using novel in-class teaching methods in lieu of textbooks to guide students’ study of English within the context of not only exploring local Taiwanese culture but also sharing it with the world.

The traditional method of teaching-to-examinations also does not adequately address the problem of learning the essential skills of English pronunciation and oral communication. Therefore, this study approached that objective by linking FC with in-class activities that connected new content-related vocabulary to orality through spelling. Since learning English speech can benefit from orthographic mapping, spelling activities afford a viable although limited method of acquiring spoken sounds (phonemes) (Berninger & Michel, 2008). The limitation relates principally to the fact that English letter combinations and spellings are frequently incongruous with their pronunciation. Thus, a student cannot learn English pronunciation in general.
through spelling. Nevertheless, by focusing on the use of contextually specific vocabulary, students can learn to orthographically map new words by equating the new sounds with spelling. Students may also learn common spelling/pronunciation incongruities in the process. Even the word culture provides an example of orthographically mapping a specific phoneme/word spelled unlike its pronunciation, /kul(t)-char/. This same mapping applies to other similar sounding words, such as “creature”, which the learner might otherwise pronounce like creator, /krē-āt-er/. More importantly, spelling activities can include both PBL tasks and supplemental CLIL while also building phonemic awareness and triggering the process of oral language acquisition. Finally, using the FC to present vocabulary material outside of class increases the amount of time spent on related oral activities in class (Nangimah, 2020).

Overall, this study measured the effect of integrating the key concepts of the abovementioned teaching methods into two university freshman English classes filled with low-achieving and largely unmotivated students. Although only one of these classes used an FC setup, both classes engaged in the same PBL or CLIL activities. One class served as the experimental group, and the other class was the control group; thus, the design of the research was quasi-experimental. The main difference between the groups was that only the experimental group had online access to course materials for each unit, including the textbook, prior to attending each class. Thus, while only the FC students could preview the unit content before coming to class, both groups of students studied the same content and used the same BPL or CLIL to create classroom activities. Although learning assessments were modified to accommodate these differences, the required tests were not abandoned for either class.

Given the parameters and circumstances of the study, the researcher predicted that an FC teaching approach combined with PBL and CLIL would improve learning strategies and performance among underachieving and undermotivated students. The results of the study also enabled an analysis of the relationships between students’ self-regulated vocabulary learning capacity and their preexisting learning experience.

3. Materials and Methods

3.1. Instructional Design and Objects

Participants. The participants in this study were low-achieving learners with English entrance exam proficiency test scores at the bottom 5% of the freshmen class at a private technology university in Taichung, Taiwan. All the participants had long-term learning motivation problems. After excluding students with diagnosed learning disabilities (2 students) and those who were not able to participate in the courses or complete a questionnaire (5 students), 26 participants were included in the experimental group (10 males and 16 females), and 26 were included in the control group (14 males and 12 females). The average age of the participants was 18 years.

3.1.1. Instruments

To measure the impact of the FC teaching method on learners, teaching method was the independent variable in the study, while the dependent variable was the effect of the method on learning achievements and motivation. Learning achievements were measured by student pronunciation performance and the results of the Nation and Beglar (2007) Vocabulary Size Test, which measures receptive vocabulary knowledge, that is, the vocabulary knowledge required for reading. The mean scores were analyzed using the Mann–Whitney U test. The pronunciation performance assessment included a pretest and a posttest. To complete the tests, the students used their devices to look at one-to-two-syllable words related to the rules of phonics. Upon seeing each word, the students recorded their perceptions of their devices. The word tokens for both tests were randomized by the computer system. It took each student approximately 20 minutes to read and record all 70 test words. The researcher scored the tests according to the pronunciation accuracy of each word in random order. An accurate pronunciation was scored as 1, while an inaccurate pronunciation was scored as 0. The mean scores were analyzed using the Mann–Whitney U test. A high degree of reliability was found between the two pronunciation tests. The average ICC was .888, with a 95% confidence interval from .805 to .936 ($F(51, 51) = 8.83, p < .001$).

The participants also took a pretest and a posttest of their English proficiency provided by the university Language Center during the first and last weeks of the semester, respectively. The exam consisted of both listening and integrated sections and 60 questions in total, for which the Cronbach’s alpha value was $\alpha = .89$. The English proficiency test results were also analyzed using the Mann–Whitney U test.

To understand how the FC method might influence students’ strategic vocabulary learning, this study also implemented Tseng et al.’s (2006) Self-Regulating Capacity in Vocabulary Learning Scale (SRCVOC). The questionnaire consisted of five facets, namely, commitment control, metacognitive control, satiation control, emotion control, and environmental control. There were 20 questions in total, and the Cronbach’s alpha was .95. The results of each group’s pre- and posttest questionnaires were analyzed by paired-samples t tests.

3.1.2. Materials

With respect to the textbook’s language learning content, although the learning activities for both the experimental and the control groups were preparatory for the culminating class activity, they were equally responsive to the textbook lessons.

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The research implemented the FC teaching method for the experimental group using 17 online course materials, including 10 quiz-incorporated pronunciation and vocabulary interactive eBook units, five quiz-incorporated sentence pattern lessons, one lesson on introductory local culture, and one lesson on how to use web applications; in this case, the postcrossing website the participants used for the main task of the course. The researcher created the videos and the eBook units, the latter using the SimMAGIC eBook program. Each unit consisted of several phonics rules (e.g., digraphs, trigraphs, diphthongs, etc.) and a follow-up listen-and-identify 20-word quiz taken after the participants learned the rules. The word recordings in the pronunciation eBook units were downloaded from 4 native speakers of American English (2 males and 2 females) using Amazon Polly. The control group learned lessons in class from the teacher. The 10 pronunciation, vocabulary, and two sentence pattern activities occupied the class prior to the midterm examination period, while three other sentence pattern activities and the major course activity, being more complex, occupied the class during the latter half of the semester.

3.1.3. Procedure

This study involved two freshman-level English classes, one from the experimental group and the other from the control group. For the experimental group, the course used an FC setup, with class materials provided online for the participants to study in advance of coming to class. For both the experimental group and the control group, the class topics and the arrangement of the classroom activities were the same and were carried out according to the principles of both PBL and CLIL.

The classroom topics covered during this study included some content that the students’ English textbooks did not include. Similarly, the planned activities and teaching objectives followed the CLIL instructional design model rather than the design model outlined in the textbook’s supplemental teacher manual. However, the class activities did not displace the key language learning content of the textbook, for which the Language Center remained accountable no matter what teaching methods instructors preferred to use.

For the 10 pronunciation and vocabulary learning activities, the students followed the interactive eBook’s page-by-page instructions and completed the 20-word online listen-and-identify training for each lesson. The purpose of the listen-and-identify training was to ensure that the students completed the online lesson before commencing the in-class activity. The FC experimental group completed this approximately 20-minute learning and training activity outside of class, while the control group used class-time to complete it. In class, after both groups listened to the teacher’s brief review of the pronunciation lesson, the students formed small teams and listened to the teacher (researcher) to repeat randomly selected vocabulary words relating to the phonics rule for the week. Each student then used individually printed alphabet letters to spell those words. For each word correctly spelled, the student’s team received one point. At the end of the activity, each member of the team with the most points earned one point in their semester grade.

The five units devoted to sentence patterns were based on practice questions presented online for the FC or in class for the control group. In both cases, the students presented their answers in class to confirm their correct composition. After the teacher reviewed the grammatical problems at issue, the students divided into teams and, using small whiteboards, rewrote or wrote new answers to questions posed by the teacher. Teams writing their answers correctly received one point. At the end of the activity, each member of the team with the most points earned one point in their semester grade.

The final task before the midterm prepared the students for the main class activity, “Taking Taiwan to the World”. To complete this activity, students needed to register an account on the Postcrossing website, which enables people to exchange real postcards randomly with other people from around the world. The experimental group of students viewed a task description video and completed the registration outside of class, while the control group operated the website on their own devices in class according to the teacher’s explanation. As part of their registrations, the students each had to create a self-introduction. The course task required both groups of students to create self-introduction videos that would be accessible online via a QR code. The students would eventually paste their QR codes to their international postcards before sending them to other postcrossing users. The postcard recipients could then use the QR code to access the student’s self-introduction video in addition to reading some brief written content sent to their postcrossing account portfolio.

The culminating task for both classes was a CLIL-designed team activity called “Taking Taiwan to the World”. Each team began by researching an aspect of local Taiwanese culture, which they would then introduce to a foreign pen pal via the Postcrossing website. The team leader guided the team as they tried to decide what local cultural content they would explore. Although the team explored and discussed the characteristics of the selected local culture together, each individual team member would eventually need to fulfill a specific task, which the team leader organized. Researching their topics challenged the students’ higher-order thinking by helping them explore their local culture more than just a surface level. They had to consider such things as the origins and contemporary relevance of their topic, which included discussing why they think the topic has persisted in their cultural landscape.

Once the team had finished their research and discussion, they worked together to write and produce a video about their cultural topic. The video was eventually linked to a QR code that the students had pasted onto their postcards. After taking a photo for archiving, the teacher mailed the postcards. For the midterm and final scores, both the teacher and the students’ peers evaluated the accuracy and clarity of pronunciation in the self-introduction and local culture videos. The peer evaluation also inspired the students to produce videos using the language proper for the target audience.

To ensure the success of the activity, the teacher first provided guidance for both groups, either in the video or in class, on how to explore local culture and how to create the videos. In addition, before they were permitted to shoot their videos,
the teacher reviewed the students' scripts in class for grammatical errors, making comments about how to enhance the content, an example of language for learning. However, the shooting and editing of all the groups' videos took place outside of class.

Communicating their insights in English to someone somewhere in Russia, America or Europe was the integrated language of learning this postcrossing activity promoted. In addition, in addition to engaging in cultural self-exploration by asking, what about this topic identifies me as Taiwanese, the students' international communications enhanced and gave purpose to their quest for global citizenship. The final step of the activity required the students to submit their individual and/or group reflections about their experience, which engaged them in a kind of evaluation, which is another type of higher-order thinking.

4. Results

4.1. Learning achievement

A Mann–Whitney U test was used to evaluate whether the FC learning achievement scores differed from those of the control group. The learning achievements scores included the English proficiency test provided by the Language Center, the pronunciation performance scores, and the VST scores. The results indicated no significant difference between groups on the English proficiency test (z = -0.74, p = .46 > .05). However, the results of the analysis indicated significant differences in the groups’ pronunciation performance scores (z = -2.13, p = .03), with the experimental group scoring higher than the control group. A significant difference in VST scores was also found between the groups. The results of that analysis indicated a difference of z = -2.97, p = .00 < .05, with the control group scoring higher than the experimental group.

4.2. SRCVOC Questionnaire

The SRCVOC questionnaire was used to investigate the students' vocabulary learning experience before and after the FC teaching method. Paired-sample t tests were used to analyze the students' learning experience. The results in Table 1 show that using digital materials for FC teaching can improve students' commitment control, as indicated by the use of "techniques for goals" (t = 2.88, p = .01 < .05), "belief in speed" (t = 2.56, p = .02 < .05), and "persistent learning" (t = 2.19, p = .04 < .05). In addition, there was a significant difference in "stress reduction skills" (t = 4.57, p = .00 < .05) and "immediate coping" (t = 2.86, p = .01 < .05) in the emotion control facet. The metacognitive control facet also showed significant differences in "concentration techniques" (t = 2.49, p = .02 < .05), "effective focus methods" (t = 2.28, p = .03 < .05), "procrastination prevention" (t = 2.54, p = .02 < .05), and "effective procrastination control" (t = 2.86, p = .01 < .05). The satiation control facet showed a significant difference only in "mood regulation" (t = 3.14, p = .00 < .05).

The SRCVOC questionnaire also investigated the vocabulary learning experience of the students in the control group through paired-samples t tests. The results in Table 2 show that teaching without the FC method significantly influenced students' commitment control, as did teaching with "techniques for goals" (t = 2.52, p = .02 < .05). The facet of emotion control also showed a significant difference in both "stress reduction skills" (t = 3.71, p = .00 < .05) and "immediate coping" (t = 2.11, p = .05). The metacognitive control facet also showed significant differences in "concentration techniques" (t = 2.49, p = .02 < .05) and "effective focus methods" (t = 2.42, p = .02 < .05).

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<th>Item</th>
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<td><strong>Commitment control</strong></td>
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<tr>
<td>When learning vocabulary, I have special techniques to achieve my learning goals.</td>
<td>0.69</td>
<td>1.23</td>
<td>2.88</td>
<td>25</td>
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<td>When learning vocabulary, I believe I can achieve my goals more quickly than expected.</td>
<td>0.73</td>
<td>1.46</td>
<td>2.56</td>
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<td>When learning vocabulary, I persist until I reach the goals that I make for myself.</td>
<td>0.42</td>
<td>0.99</td>
<td>2.19</td>
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<td><strong>Emotion control</strong></td>
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<td>When I feel stressed about vocabulary learning, I know how to reduce this stress.</td>
<td>1.12</td>
<td>1.24</td>
<td>4.57</td>
<td>25</td>
<td>.00*</td>
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<td>When I feel stressed about my vocabulary learning, I cope with this problem immediately.</td>
<td>0.62</td>
<td>1.10</td>
<td>2.86</td>
<td>25</td>
<td>.01*</td>
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<td><strong>Metacognitive control</strong></td>
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<td>When learning vocabulary, I have special techniques to keep my concentration focused.</td>
<td>0.54</td>
<td>1.10</td>
<td>2.49</td>
<td>25</td>
<td>.02*</td>
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<td>When learning vocabulary, I think my methods of controlling my concentration are effective.</td>
<td>0.42</td>
<td>0.95</td>
<td>2.28</td>
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Table 2 Pre- and post-SRCVOC questionnaire results for the control group.

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<td><strong>Commitment control</strong></td>
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<td>When learning vocabulary, I have special techniques to achieve my learning goals.</td>
<td>0.65</td>
<td>1.32</td>
<td>2.52</td>
<td>25</td>
<td>.02*</td>
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<td><strong>Emotion control</strong></td>
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<tr>
<td>When I feel stressed about vocabulary learning, I know how to reduce this stress.</td>
<td>1.12</td>
<td>1.53</td>
<td>3.71</td>
<td>25</td>
<td>.00*</td>
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<tr>
<td>When I feel stressed about my vocabulary learning, I cope with this problem immediately.</td>
<td>0.54</td>
<td>1.30</td>
<td>2.11</td>
<td>25</td>
<td>.05*</td>
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<td><strong>Metacognitive control</strong></td>
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<tr>
<td>When learning vocabulary, I think my methods of controlling my concentration are effective.</td>
<td>0.62</td>
<td>1.30</td>
<td>2.42</td>
<td>25</td>
<td>.02*</td>
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<tr>
<td><strong>Satiation control</strong></td>
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<tr>
<td>When feeling bored with learning vocabulary, I know how to regulate my mood in order to invigorate the learning process.</td>
<td>0.73</td>
<td>1.19</td>
<td>3.14</td>
<td>25</td>
<td>.00*</td>
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*p < 0.05

4.3. Summary

The learning achievements revealed that the FC method had no effect on either the students’ scores on the university language learning center’s English proficiency tests or on the students’ VSTs. However, the pronunciation performance of the experimental group was significantly better than that of the control group. On the other hand, even though the learning achievements of the experimental group included only one optimistic test, the questionnaire results indicated that the experimental students had greater control over their vocabulary learning strategies or capacity in areas such as commitment (i.e., belief in speed, persistent learning), emotion (i.e., stress reduction skills), metacognition (i.e., procrastination prevention, effective procrastination control), and satiation (i.e., mood regulation).

5. Discussion

This research was carried out in the context of the university’s compulsory general education freshman English courses. Since the students were just beginning their university studies, they had few preconceived expectations regarding teaching methods, making it relatively easy to implement an innovative teaching environment.

One of the aims of this study was to determine whether innovative teaching methods can improve students’ learning motivation. The research results showed that using an FC combined with PBL and CLIL course activities can improve pronunciation performance and the self-regulating capacity for vocabulary learning. This innovative teaching experiment yielded several positive results, as follows:

5.1. Mutual learning and collaborative literacy

The students learned the content of the class by completing group projects that supported peer interaction and diversity, forming a mechanism of mutual learning whereby different kinds of students exchanged ideas and information (Fan, 2018). The discussions naturally reflected these differences between group members, revealing some to be suitable as leaders and others as achievers, supporters, reporters, and so forth. Therefore, these activities foster cooperative learning and collaborative literacy, that is, learning things and developing ways to express that knowledge with others (Wang, 2022).

5.2. The value of human interaction in teaching and learning

This research revealed that the live teacher–student interaction intrinsic to FC teaching communicates content more effectively than does a textbook. With the FC, the textbook and other preclass materials prepare the students to learn interactively in class with their peers and teachers. However, in a traditional classroom, interaction is incidental because the teacher essentially presents the content of the textbook, which the students review on their own while also completing assigned homework.

5.3. Cross-cultural communication activities motivate learning

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Creating and sharing culturally resonant postcards heightened the students’ awareness of English as an international tool of communication. After receiving postcard replies from overseas and online messages from foreign senders, students formally communicated across cultures in English, which meant that completing the activities of the course stimulated their desire to learn.

5.4. FC and cognitive load

This study used digital teaching materials to implement an FC teaching model. In class, PBL and CLIL activities provided meaningful language learning activities, ensuring the valuable use of classroom time. The research results show that this model is consistent with that reported in previous research. The FC teaching method can effectively improve autonomous learning and interaction among peers and can promote learning effectiveness (Hsu, 2017; Zhang, 2018) (Hsu, 2017; Zhang, 2018). This model makes classroom time more flexible and provides students with more opportunities for questioning and group interaction during practical class learning activities (Ozdamli & Asiksoy, 2016).

However, since the teaching materials used in the FC teaching method include not only digital textbooks but also materials designed for interactive learning, the cognitive load may be excessive for some students (Roussel et al., 2017).

In terms of cognitive load theory, extraneous cognitive load refers to things other than the actual learning content, such as the presentation format, the learning environment, or the way the information is organized. However, intrinsic cognitive load refers to the natural mental effort required to study new or complicated learning content. If this is very difficult, as is the case for Shakespeare for some students, then the difficulty may exceed the level at which a student is capable of comprehending, which can discourage learning (Roussel et al., 2017). The teacher can determine by knowledge and insight whether the learning content exceeds their students’ cognitive load limits.

This study incorporated both short and interactive pronunciation eBook units, which might have resulted in the students’ significant pronunciation performance on the posttest. According to the results of the questionnaire, the FC teaching method improved students’ learning persistence and mood regulation. The results indicate that the topics chosen for the low-achieving students were not too complex for them to understand. The presentations in the videos and the eBook units provided clear explanations and visual aid. In addition, the FC teaching method allowed the students more time for interaction opportunities as a team in class. The teacher was able to provide clear guidance and encouragement based on each team’s project. Additionally, the results of the questionnaire demonstrated that teaching circumstances prevented the students from procrastinating.

Finally, a germane cognitive load allows a person to process information most efficiently. Both teachers and students can control whether the level of cognitive load is germane. For students, this is the result of controlling their study habits and environment to the extent that learning feels automatic or effortless. Or, in another sense, it is the teacher establishing a classroom routine that makes learning something new seem familiar to the students. In fact, education is quite often the result of a student recognizing something they did not realize they already knew. Thus, germane cognitive load utilizes teaching materials and methods that promote learning through students’ comfortable use of their working memories (Sweller et al., 2011; Turan & Goktas, 2016). However, germane cognitive load is always at the mercy of both intrinsic and extraneous cognitive load. For this reason, in-class activities need to involve enough people to distract students from their devices, which increases extraneous cognitive load. On the other hand, these activities are not so complicated that students can be lost or confused when trying to determine what to do. This study revealed that the FC teaching method reduced students’ learning anxiety (extraneous cognitive load) while enhancing their learning interest (germane cognitive load). In other words, FC more readily fostered germane cognitive load than did the teaching methods used in the control group.

The digital materials used in this study consisted of an average of 20 minutes of lessons and online exercises each week. The content was focused and simplified to reduce the possibility of intrinsic cognitive load, which suggested that the eBook units and learning materials should heed this principle. However, the downside of digital teaching material is that fostering ubiquitous learning may also unintentionally open the door to extraneous cognitive load. In other words, a student might just as easily study in a noisy coffee shop as in a quiet library, but such has always truly been the case.

5.5. The study in context

The research participants in this study were low-achieving freshman learners of English. However, the researcher believed that these students simply lacked the opportunity to have a positive learning experience, which left them without a purpose for learning. To shift the students’ learning attitudes in a positive direction, this study sought to reboot their learning experience by turning familiar things upside down or shaking things up with an FC teaching approach.

By beginning with English pronunciation and proceeding to sentence patterns, the students had the immediate experience of recognizing things with which they should already have been familiar from their school English classes. The in-class PBL pronunciation activities guided them from familiarity to natural learning through practice in a positive affective environment, thereby allowing them to rediscover a sense of purpose in learning.

https://www.malque.pub/ojs/index.php/mr
The higher-order thinking skills necessary for making a video about local culture cultivate each student’s individual process of learning by exploring a cultural topic. Thus, the FC reversed not only the site of technology in the teaching process, from the classroom to the student’s personal life but also the direction in which students learn English, from digitally interactive presudy to live action classroom learning, rather than from a teaching classroom that uses technology to a solitary homework assignment that uses a textbook and possibly a supplemental workbook. Therefore, this study suggests that the motivation of low-level L2 learners, now and into the future, depends upon linking virtual language teaching to the student’s real-life environment while moving the activities of language learning to a living educational environment.

The main title of this study, Taking Taiwan to the World, has important roots in both historical and contemporary contexts. From its inception in 1911, the leaders of the Republic of China recognized the importance of opening up to the modern world by assuming an outward-looking international profile. Unfortunately, wars throughout the 20th century made progress on that front slow. However, at the end of one-party rule in Taiwan, the country’s leaders once again recognized that future stability rested on taking Taiwan to the world. Likewise, in September 2021, the present government established the Bilingual 2030 initiative, promoting English as vital to the future of Taiwan. Unfortunately, the Taiwanese model of education has never supported the kind of creative learning necessary to foster a modern bilingual international society. The pressure on students to excel on examinations so they can proceed from one level of schooling to the next merely turned the study of English into its being just another subject leading to yet another examination. As a result, most students never learn to express, discuss, or debate ideas in English. Hopefully, this study demonstrates a solution to that problem by offering innovative approaches operative within the present educational structure that will also trigger institutional changes that take Taiwan to the rest of the world.

**Ethical Considerations**

Not Applicable.

**Conflict of Interest**

The authors declare no conflict of interest.

**Funding**

Republic of China (Taiwan) Teaching Practice Research Program

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