

Gender Disparity of Translanguaging in Language Forms

—A Case Study of Excellent English Teachers in Chinese Secondary Schools

Guojie Yin

School of Foreign Languages, Mianyang Teachers' College, Mianyang, China

Email: yaleygj@mtc.edu.cn

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Abstract

Translanguaging is an important part of research in language and characters, although it has not reached a unanimous definition. It exists in the process of teaching in different forms of language, and the use of it may vary according to individual differences among teachers. This paper explores the use of different forms of language and gender differences in translanguaging among 10 excellent English teachers in Chinese secondary schools, with records on a classroom observation sheet. After a combination of quantitative and qualitative analyses, results show that differences appear among individual teachers in the use of different forms of language in class, and male teachers tend to use more body language than the target language and students' native language, while female teachers tend to use more target language than body language and students' native language. The results offer us a more thorough understanding about gender differences in translanguaging.

Keywords

Translanguaging, Language Form, Difference, Gender

1. Introduction

Translanguaging, as an interdisciplinary research focus in language, literature and education, has been attracting publicity in the past 20 years. The total number of studies on translanguaging in China is not great. Searching results from CNKI Chinese journal articles and dissertations (up to Dec. 31, 2022), with “translanguaging” as the searching word in title of articles, shows that there are 84 articles, including 11 dissertations, 60 academic journal papers, 9 featured journal papers, and 3 academic collection papers. The first three papers appeared in

1987, and the number of relevant papers in each year was less than 10. The main topics of literature researches revolve around the factors of translanguaging, cultural signifiers in translanguaging, skills of translanguaging, subtitle translation, translanguaging information, etc. While secondary topics revolve around translation practice, the theory of schema, experience pool, translation of subtitles, communicative contexts, and strategies of translation, etc.

The researches focus on the two major disciplines of foreign languages and characters, and Chinese language and characters. There are also some documents in the fields of literary theory, secondary education, and Chinese literature. Nevertheless, specifications of translanguaging in language forms by teachers and its distribution in classes have not yet been explored and discussed.

2. Literature Review

So far, contents of the present researches focus on understandings and the use of translanguaging skills.

2.1. Understandings of Translanguaging Skills

Understanding of “translanguaging” is not consistent, nor is it unified in published articles in China and the West. As [Li & García \(2017\)](#) have noted that there is no unanimous expression for “translanguaging”, and terms such as “polylinguaging”, “polylinguallanguaging”, “multilinguaging”, “heteroglossia”, “hybrid language practices”, “translingual practice”, “flexible bilingualism”, and “metro-lingualism” have been used. Translanguaging is often taken as a translanguaging skill in many papers.

Translanguaging skills are essentially dynamic language practice abilities for multilingual speakers to express meaning using the full resources of their linguistic experience pool. [Canagarajah \(2011\)](#) took translanguaging skills as the ability of multilingual users to move between languages and integrate multilingual practices into their experience pool from an integrative perspective. [García et al. \(2014\)](#) argued that translanguaging skills were multilingual users’ ability to carry out multi-lingual practices in order to construct different world meanings represented by different languages, which broke through the European tradition of limiting translanguaging skills to two languages. [Jones \(2017\)](#) defined translanguaging in a class as a teaching strategy that intentionally integrates two or more languages. [Baker \(2021\)](#) proposed that translanguaging skills were the ability to construct meaning, organize experiences, gain knowledge, and understand the world in two languages. [Lewis et al. \(2021\)](#) thought that translanguaging skills were a dynamic, functionally integrated way of two languages that organized and regulated learners’ cognitive comprehension processes and literacy development.

[Canagaraja \(2011\)](#) summarized the assumptions for translanguaging: for multilingual speakers, each language is not a separate or closed system, but an integral part of its overall “experience pool”; extralinguistic skills emerge in the process

of communicative negotiation through multilingual practice in specific contexts; multilingual competence is not a collection of each language ability, it is a holistic concept, embodied in the symbiotic collaboration of symbols and their functions represented by different languages in the language user's experience pool. [García & Leiva \(2014\)](#) used theories of cross-culture, self-creation, colonialism, and boundary thinking to construct translanguaging, and proposed that translanguaging was both a bilingual pedagogy and a bilingual behavior. [Liang & Wang \(2020\)](#) summarized the academic development of translanguaging in China and proposed that the term was originated from the Welsh Revival Movement, or from linguistic expressions, or from code conversion, or was synonymous with code mixing. Some researchers ([Li, 2018](#), [Bao & Li, 2022](#)) believe that translanguaging is a linguistic practice theory of applied linguistics, which breaks the boundaries between different languages, verbal and non-verbal behaviors, and between language and cognition, modalities and symbols, and pays more attention to people's creative and dynamic use of multiple languages, multiple symbols and cognitive resources.

The theory of translingual practice adheres to a multimodal view of social symbols, which holds that language is a multilingual, multi-symbolic, multi-sensory, and multimodal resource that produces meaning, and that language users have the overall multidimensional ability to coordinate these resources, and show critique and creativity through translingual practice. The practice of translanguaging breaks down boundaries beyond languages, language variants, and sublanguages, not only the mixing of different linguistic resources, but also the expression and negotiation of various identities in the new social space.

2.2. Use of Translanguaging

Researchers believe that the purpose of teachers' use of translanguaging in classes is to develop students' multilingual skills. This strategy can help students gain discourse, establish effective language user identity, and participate actively in meaning negotiation and interaction, which is conducive to knowledge construction. [Silverman et al. \(2017\)](#) reported that when learners were beginners or group members shared a language, teachers invited them to co-construct meaning or participate in speech using the learner's native language or shared language; when the group participants had sufficient language knowledge, the teacher used translanguaging to engage students in bilingual conversations. [Kiramba & Harris \(2019\)](#) argued that translanguaging contributed to learners' intellectual and emotional development, social interaction, and academic success. [Leonet \(2020\)](#) found that translanguaging acted as a pedagogical scaffold, enabling students to use a variety of resources to help negotiate meaning with each other, and it allowed them to use multilingual resources to strengthen their identity, promote cohesion, and build harmonious interpersonal relationships. After studying a case of a third-grade dual-lingual teacher using a flexible bilingual model for teaching, [DeMatthews & Izquierdo \(2019\)](#) believed that the use of translanguaging as a resource had the potential to change bilingual teaching in

dual-language bilingual education (DLBE). From a materialistic and information-theoretic point of view, the translanguaging practice can produce more meaning because it gives us more combinations by compiling different linguistic sources throughout history (Lemke & Lin, 2022).

Some researchers also attend to characteristics of the use of translanguaging. Yuan & Zhou (2015) described language as an ongoing process in which language exists in the process of language use, i.e., from language to language skills. The process of language use is one of constructing, storing, extracting, and communicating experience, so learning new language skills is not just about memorizing a code or rule system, but about learning a new way of being and doing. Finally, language skills are fluid and flexible in nature, and people with skills in two or more languages will naturally use all their linguistic resources to construct personal practices and experiences.

The present literature has not explored the matter of gender disparity in translanguaging use, nor explored the specific use of forms of language in the class by teachers. Therefore, it is worthwhile to have a discussion.

The aim of this study is to find out gender disparity and specific use of language forms in translanguaging by TEFL teachers, so it can bridge the research gap in this matter in China and help teachers have a more clear understanding about their own translanguaging in classes. It is believed that translanguaging exists in the process of teaching in different forms of language, and the use of translanguaging may vary according to individual differences among teachers. Therefore, teachers' use of translanguaging also reflects the gender disparity.

3. Methodology

3.1. Research Objectives

The purpose of this paper is to make clear whether and what differences in translanguaging between male and female TEFL teachers in classes. To make it specific, this study tends to achieve the following two objectives:

- 1) to offer a fairly detailed presentation of the specific use (the distribution) of language forms in classes, or the specific use of native language, target language (English in this case) and body language;
- 2) to make a comparison about the use of language forms in translanguaging to see whether gender differences appear and what differences may appear between male and female teachers in translanguaging.

3.2. Research Questions

To achieve the research objectives, this paper will focus on the following two questions.

- 1) What types of translanguaging are used in classes by male and female teachers? From the perspective of forms of language, translanguaging covers the use of learners' mother tongue (native language), the target language, and body language. So what forms of language are used in classes by male and female

teachers in the course of instruction?

2) What differences are there between male and female teachers in translanguaging use? Or what are the differences between male and female teachers in using learners' mother tongue (native language), target language, and body language?

3.3. Sampling

Subjects for this study are English teachers who have worked in secondary schools in Sichuan Province for more than 15 years and have a professor-equivalent title. These teachers are rich in teaching experience and have a high degree of professional development. Meanwhile, they usually attend to students' physical and psychological growth and overall development. They are adaptive in translanguaging use.

Since these teachers are limited in quantity, and not all of them are willing to accept this kind of investigation, the research team contacts via telephone calls or e-mails for their agreement to participate as subjects. To obtain typical data, the research team makes certain that the subjects are from different schools.

3.4. Research Instruments

We have designed a Classroom Observation Sheet to record the subjects' translanguaging from the perspective of the forms of language used in classes. The subjects' use of language forms is recorded at a time interval of 6 seconds, so there are 10 records per minute, and each subject is recorded for 25 minutes.

The primary data are analyzed with Microsoft Excel as a basic tool, and charts and graphs are drawn to visualize the results. Data on the Classroom Observation Sheet for the subjects are put in Microsoft Excel tables, and then the sum for the occurrences of native language, target language and body language are counted, and the corresponding frequency is calculated. Charts and graphs are drawn based on the calculated data.

4. Results

This paper adopts a combination of quantitative and qualitative classroom observation. According to the objectives, an observation checklist for translanguaging in class has been designed. Then, translanguaging in class is observed and recorded. At last, the data of translanguaging by teachers are analyzed, and questions are discussed.

In this study, we collected 10 video records of 10 subjects from different secondary schools in Sichuan Province, including 5 male and 5 female teachers. Six of the subjects are working in senior high school, four in junior high school. Contents of the lessons cover grammar, reading, writing, listening and speaking, listening, speaking (**Table 1**).

Language forms used by subjects are recorded on the Classroom Observation

Table 1. General info about subjects.

| Subject Code* | Gender | Content of Class | Type of Class | School |
|---------------|--------|----------------------------------|----------------------|--------------------|
| T1 | M | British and American English | Reading | Senior High School |
| T2 | M | My New Teachers | Listening | Senior High School |
| T3 | F | Animals in danger | Grammar | Senior High School |
| T4 | F | What color is it? | Speaking | Junior High School |
| T5 | M | My New Teachers | Writing | Senior High School |
| T6 | F | What's the best movie theater? | Listening & speaking | Junior High School |
| T7 | F | A Lively City | Reading | Senior High School |
| T8 | M | Music Born in America | Grammar | Senior High School |
| T9 | F | I used to be afraid of the dark. | Listening & speaking | Junior High School |
| T10 | M | Why do you like pandas? | Listening & speaking | Junior High School |

(*Note: All subjects are coded instead of their names for the sake of privacy.)

Sheets (see Appendix at the end of this article) for the 25-minute class segment. Figures are drawn to show the distribution of language forms (L1 for mother tongue, L2 for target language, L3 for body language) used by subjects per minute in a 25-minute class segment. The horizontal axis indicates the time length of the class, and the vertical axis indicates the number of language forms counted at an interval of 6 seconds. Therefore, the maximum for each form of language is 10, while the minimum is 0. **Figures 1-10** present the results of distribution of language forms in class time.

From the above figures, we can see that the distribution and frequency of different language forms used by subjects are uneven, and the scope of fluctuation varies among subjects. Some subjects involve some forms of language more frequently than others, and some subjects are seemingly able to balance the involvement of different language forms.

5. Discussions

In this part, the two previously set research questions are discussed one by one to illustrate what forms of language are preferred by the subjects, and whether male and female teachers have different preferences.

5.1. Forms of Language in Translanguaging

For the first question “What types of translanguaging are used in classes by male and female teachers?”, we counted the number and frequency of different language forms used by the subjects for comparison (**Table 2**).

From **Table 2**, we can see that six subjects have used the mother tongue (L1),

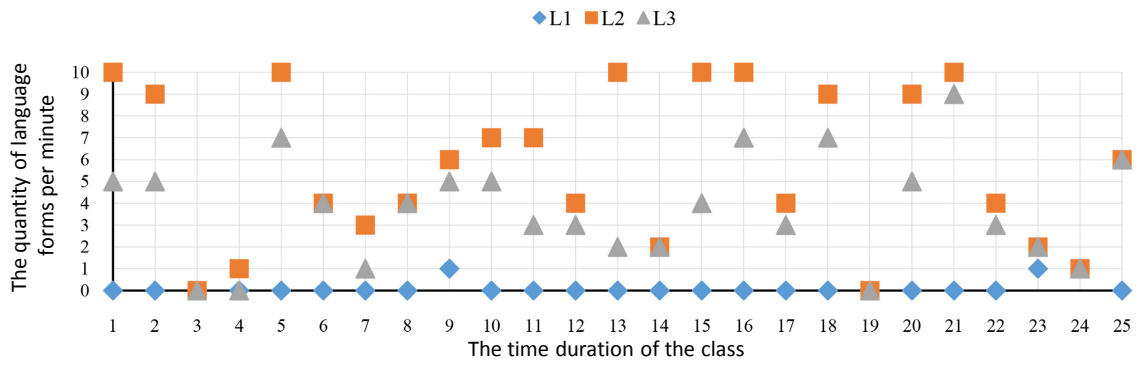


Figure 1. Translanguaging for T1.

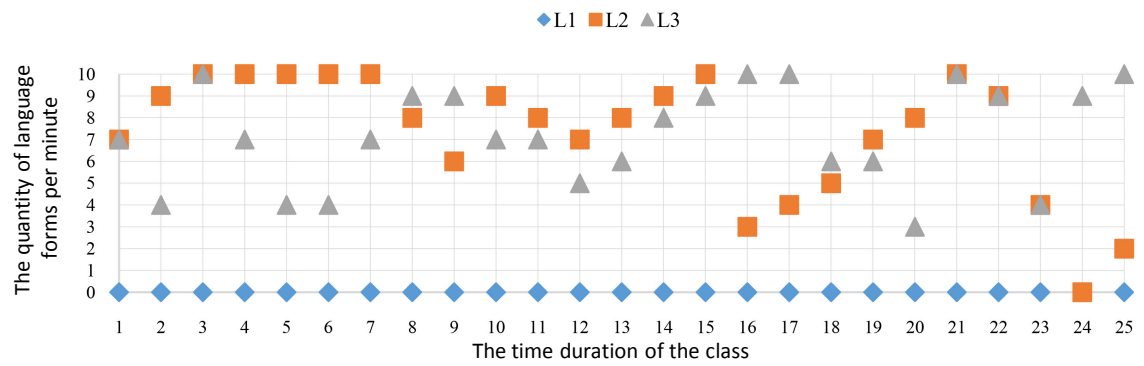


Figure 2. Translanguaging for T2.

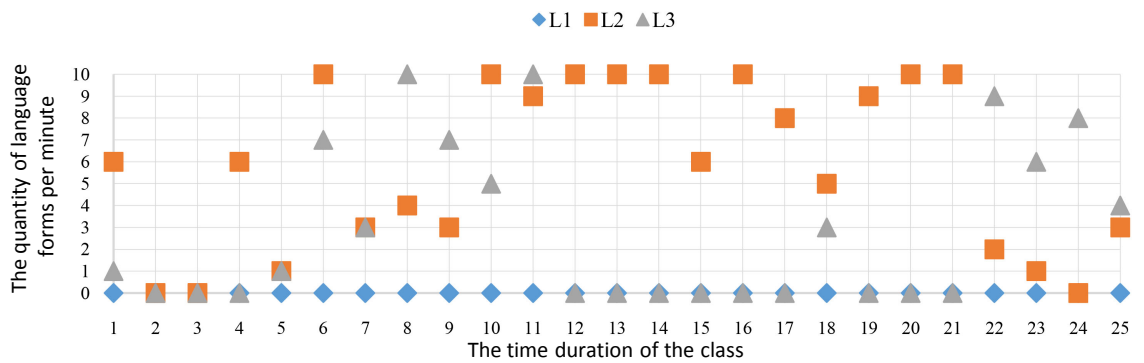


Figure 3. Translanguaging for T3.

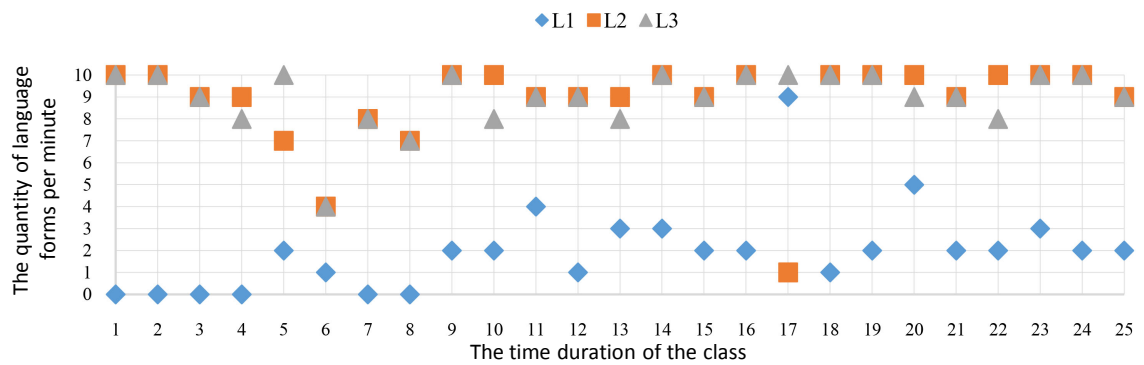


Figure 4. Translanguaging for T4.

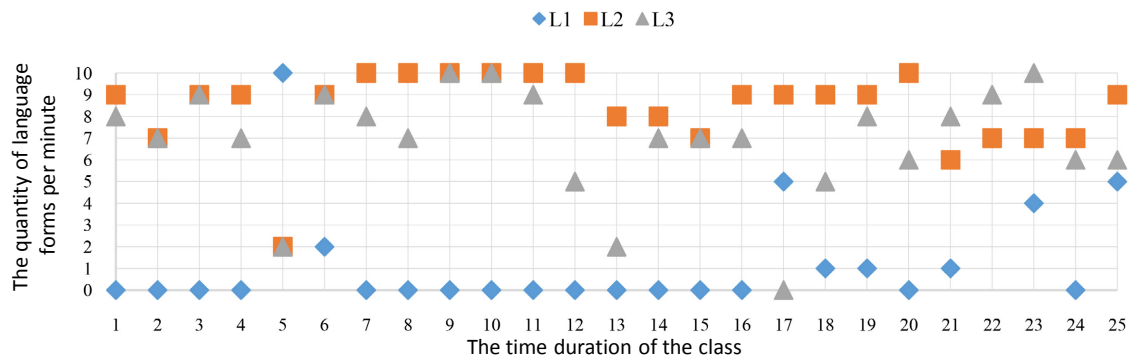


Figure 5. Translanguaging for T5.

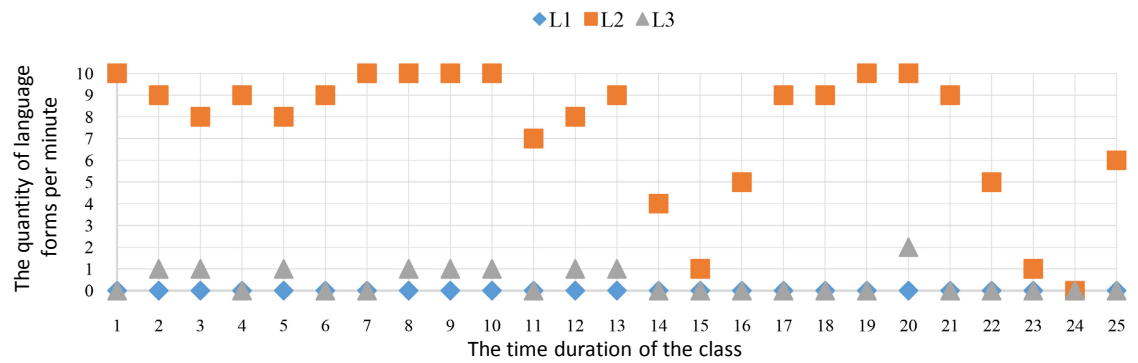


Figure 6. Translanguaging for T6.

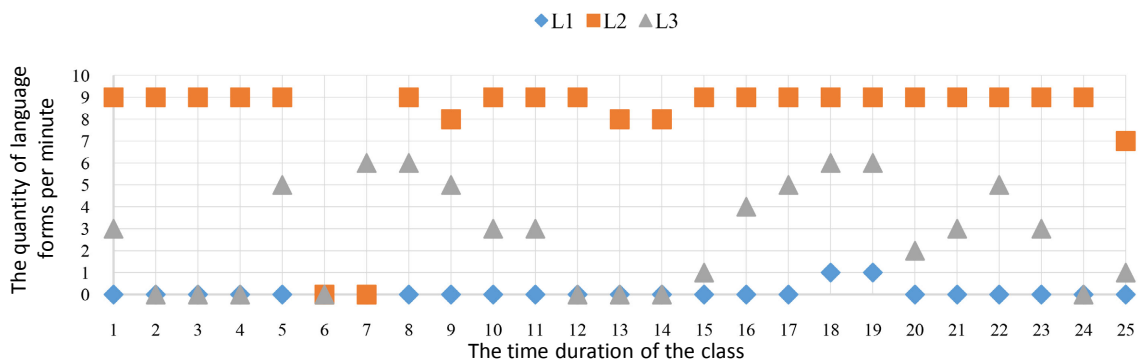


Figure 7. Translanguaging for T7.

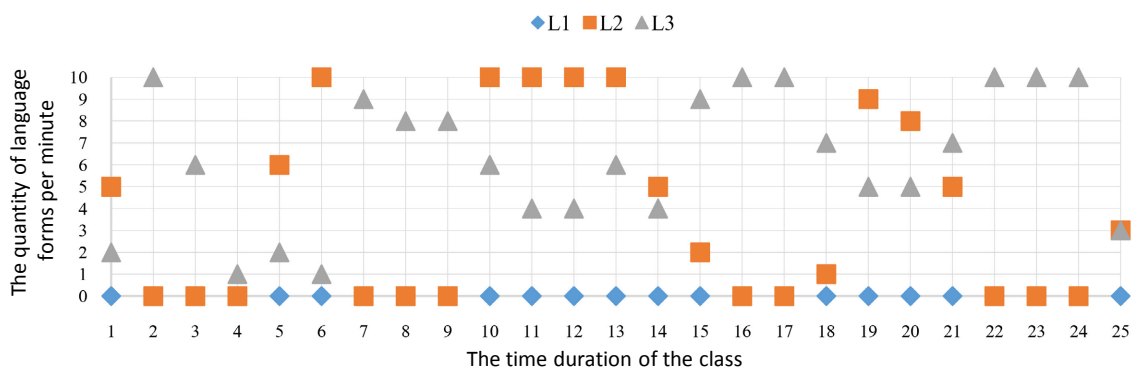


Figure 8. Translanguaging for T8.

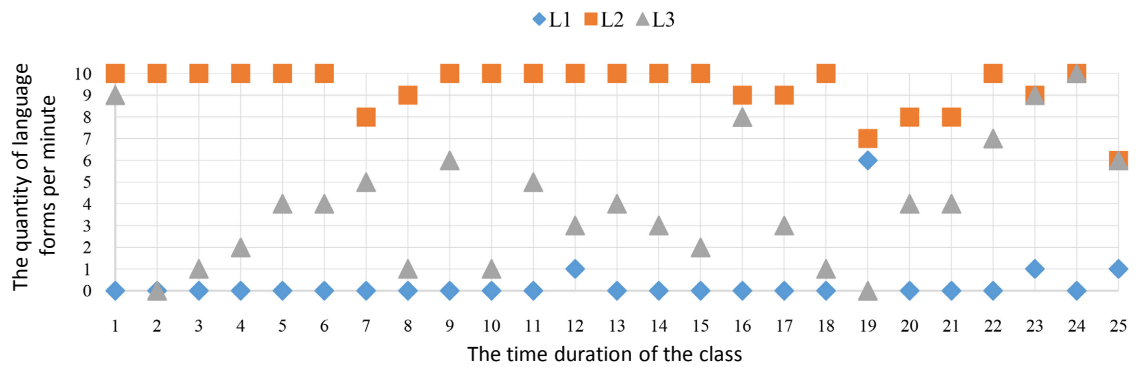


Figure 9. Translanguaging for T9.

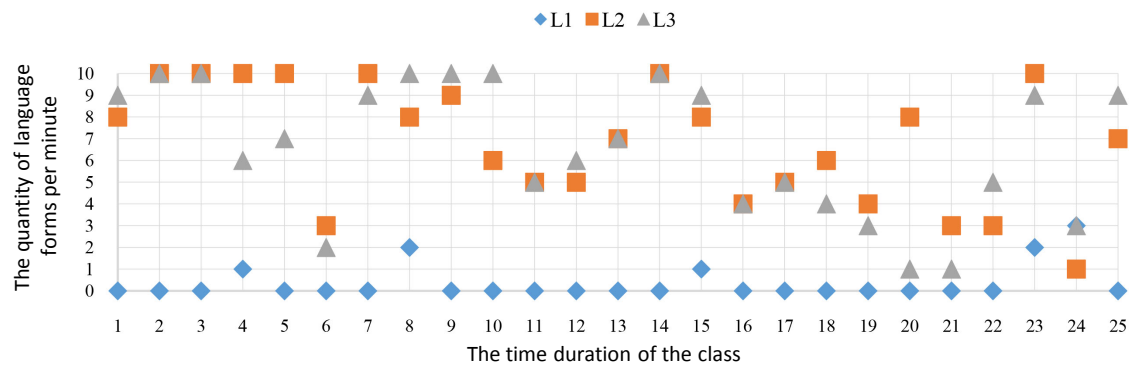


Figure 10. Translanguaging for T10.

Table 2. Number and frequency of translanguaging.

| Subject Code | L1 - mother tongue | | L2 - target language | | L3 - body language | |
|--------------|--------------------|-----------|----------------------|-----------|--------------------|-----------|
| | quantity | frequency | quantity | frequency | quantity | frequency |
| T1 (M) | 3 | 0.12 | 142 | 5.68 | 93 | 3.72 |
| T2 (M) | 0 | 0 | 183 | 7.32 | 180 | 7.20 |
| T3 (F) | 0 | 0 | 146 | 5.84 | 74 | 2.96 |
| T4 (F) | 50 | 2 | 219 | 8.76 | 224 | 8.96 |
| T5 (M) | 36 | 1.44 | 210 | 8.40 | 172 | 6.88 |
| T6 (F) | 0 | 0 | 186 | 7.44 | 10 | 0.40 |
| T7 (F) | 2 | 0.08 | 202 | 8.08 | 67 | 2.68 |
| T8 (M) | 0 | 0 | 94 | 3.76 | 157 | 6.28 |
| T9 (F) | 9 | 0.36 | 233 | 9.32 | 102 | 4.08 |
| T10 (M) | 9 | 0.36 | 170 | 6.80 | 164 | 6.56 |

target language (L2), and body language (L3) in class, while four other subjects haven't used L1 in class. That is, three male and three female subjects have used all three forms of language in the class, while two male and two female subjects have used L2 and L3. We can also see that differences appear among the individual subjects in both the amount and the frequency of using different forms of language. T4 and T5 have used far more L1 than other subjects, T9 and T4 have

used the maximum L2, and T4 has used the maximum L3, while T8 has used the minimum L2 and T6 has used the minimum L3. Therefore, T4 is the most enthusiastic one of using different forms of language in class.

Based on the data from **Table 2**, we have drawn a figure (**Figure 11**) showing the frequency of using different language forms by different subjects in this program.

To sum up, 10 subjects have used different language forms in the class, and individual differences are clear among different subjects in using different forms of language.

5.2. Gender Differences in Translanguaging

Since it is certain that differences appear among subjects in using different forms of language, it is worthwhile to discuss the differences between male and female subjects in using different forms of language, or the second question (What differences are there between male and female teachers in translanguaging use?) set for this project.

To have a general idea about the differences between male and female teachers in the use of different forms of language, we counted the sum of language forms used by male and female subjects and drew a diagram for the use of language forms (**Figure 12**).

It's clear that male subjects have used body language (L3) more than the target language (L2) and the mother tongue (L1), and female subjects have used the target language (L2) more than body language (L3) and the mother tongue (L1). Both male and female subjects have used L1 far less than L2 and L3. It can be seen that female subjects have used L1 about 27% and L2 about 23% more than male subjects, but the male subjects have used L3 nearly 200% more than female subjects.

As for the average frequency of language forms, both male and female subjects have used L1 far less frequently in class than L2 and L3, and L2 is the most frequently used language form. For female subjects, the use of L2 is more frequent than L3 and L1, while there is just a little difference between the use of L2 and L3 for male subjects (**Figure 13**).

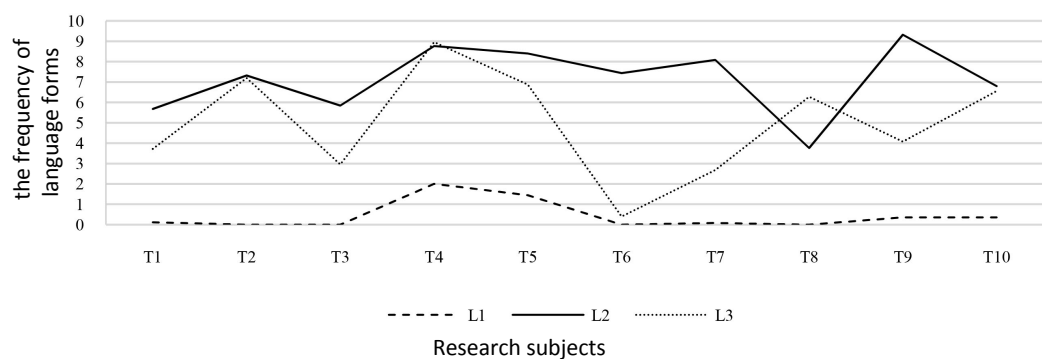


Figure 11. Frequency of language forms.

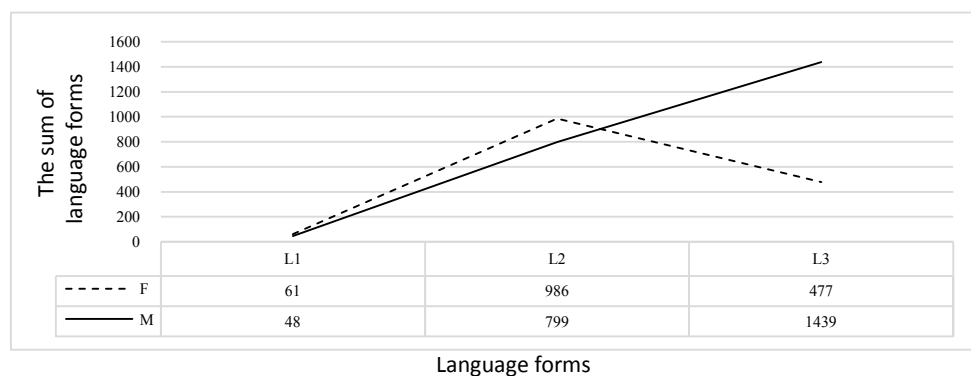


Figure 12. Language forms by male and female subjects.

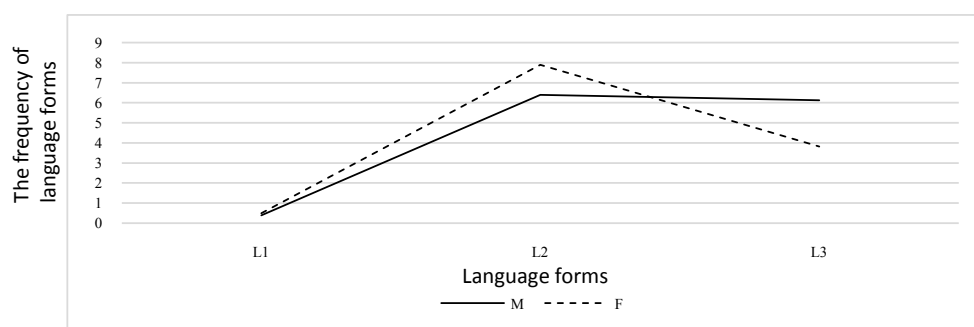


Figure 13. Frequency of language forms.

It can be seen that differences exist between male and female teachers in the quantity and frequency of use of the three different language forms. In an EFL class, learners' mother tongue is far less used by English teachers.

Why do male teachers prefer body language so much than female teachers? It may be that male teachers are superior to female teachers in physical power and they tend to move more around and use more hand gestures in class. It may also be true that it is traditionally accepted in China that the female should behave elegant and quiet while the male should behave masculine and powerful in public.

Some may still feel doubtful or unimpressed about the gender differences in the use of translanguaging. They may argue that individual differences in translanguaging are common and universal, with nothing to do with gender, for teachers are delivering different lessons to students. To further explore differences in the use of translanguaging between male and female teachers, we analyzed the number and frequency of language forms from the point of class types, i.e., reading, grammar, and listening and speaking. We compared male and female teachers delivering the same class type with the same version of textbook for the same length of time.

First, we made a comparison of the use of translanguaging in English reading classes at T1 (male) and T7 (female). The results are shown in **Table 3**.

Both teachers have a very low frequency of use of their mother tongue, and the female teacher has used the target language more than the male teacher, while the male teacher has used body language more than the female teacher.

The central objective of the reading class is for students to understand English materials and get information with the help of reading techniques, and students' proficiency in the target language (English), not their mother tongue, will certainly determine how much and how well they can understand the texts. So it's rarely necessary for teachers to use students' mother tongue in an English reading class. However, the use of body language can give students some hints or clues and help them understand the text. Therefore, body language is used more than students' mother tongue. The male teacher has used more mother tongue and body language than the female teacher. It concurs with the public's general perception that female are superior to the males in language learning and use. To sum up, for the reading class in this project, both the male and the female teacher are open to the use of different forms of language, and the female teacher tends to use the target language more than the male teachers, while the latter tends to use more body language than the former.

Secondly, we made a comparison of the use of translanguaging in grammar classes by T8 (male) and T3 (female). The results are shown in **Table 4**.

Neither the male nor the female teacher has used students' mother tongue, and the male teacher has used body language much more than the female teacher, but the latter has used target language clearly more than the former. Although most teachers and students in China agree that the ultimate goal of learning English grammar is to understand others and express us accurately, they have spent much time and energy in English grammar but with dissatisfactory results. To most Chinese students, English grammar is difficult and important, and many English teachers in China often overstress grammar in language learning. Before the 2010s, many English teachers in primary and secondary schools teach students grammar deductively and mechanically, using Chinese as the medium of instruction. With the development of curriculum reform in China, many teachers have changed their perceptions about English language instruction, paying more attention to students' thinking and creativity. Inductive method has gained popularity in teaching grammar, and the use of students' the mother tongue is no longer regarded as a necessity. Meanwhile, meaningful and communicative tasks are often assigned to students to learn and use grammar. So the use of the target language increases. Interestingly, body language is still a very popular mean for teachers to conduct grammar classes. To sum up, for the grammar class in this project, both the male and female are exclusive to the use of the mother tongue, and the female teachers tends to use the target language more than the male teachers, while the latter tend to use more body language than the former.

Table 3. Use of language forms in English reading class.

| Subject Code | L1 - mother tongue | | L2 - target language | | L3 - body language | |
|--------------|--------------------|-----------|----------------------|-----------|--------------------|-----------|
| | quantity | frequency | quantity | frequency | quantity | frequency |
| T1 | 3 | 0.12 | 142 | 5.68 | 93 | 3.72 |
| T7 | 2 | 0.08 | 202 | 8.08 | 67 | 2.68 |

Thirdly, we made a comparison of the use of translanguageing between male and female teachers in listening and speaking classes. In this project, there are one male (T10) and two female (T6 and T9) teachers delivering a listening and speaking class. Therefore, we compared the three together. The results are shown in **Table 5**.

All three teachers used target language more than body language and mother tongue. One female teacher (T6) did not use students' mother tongue and used very few body languages. The other female teacher (T9) used the target language clearly more than T6 and T10, and body language a little less than the male teacher. The male teacher used the target language less, but with more body language, than the two female teachers. The male teacher and one female teacher (T9) used the same amount of mother tongue in class. The goal of a listening and speaking class is for students to understand the spoken text (speakers) on the one hand and express themselves correctly, fluently, and appropriately about a given topic or theme on the other hand. Therefore, it is understandable that the target language accounts most of the class time, and students' mother tongue is avoided or at least reduced in amount purposefully for the sake of students' language learning and use. When difficulties arise for students to understand or express, and it's not efficient or difficult for the teacher to explain in English, students' mother tongue can be a good choice, and body language is always a good plus to help students understand or express. Therefore, the three teachers share the same perceptions about English listening and speaking classes and conduct the class appropriately. Of course, T6 acts very quiet and sticks to the idea of an English-only class, while T9 and T10 are a bit active and adaptive in class. To sum up, for the grammar class in this project, the female teachers tend to use the target language more than the male teacher, while the latter tends to use more body language than the former; different attitudes towards students' mother tongue appear between the two female teachers.

Table 4. Use of language forms in English grammar classes.

| Subject Code | L1 - mother tongue | | L2 - target language | | L3 - body language | |
|--------------|--------------------|-----------|----------------------|-----------|--------------------|-----------|
| | quantity | frequency | quantity | frequency | quantity | frequency |
| T8 | 0 | 0 | 94 | 3.76 | 157 | 6.28 |
| T3 | 0 | 0 | 146 | 5.84 | 74 | 2.96 |

Table 5. Use of language forms in English listening & speaking class.

| Subject Code | L1 - mother tongue | | L2 - target language | | L3 - body language | |
|--------------|--------------------|-----------|----------------------|-----------|--------------------|-----------|
| | quantity | frequency | quantity | frequency | quantity | frequency |
| T10 | 9 | 0.36 | 170 | 6.8 | 164 | 6.56 |
| T6 | 0 | 0 | 186 | 7.44 | 10 | 0.4 |
| T9 | 9 | 0.36 | 233 | 9.32 | 102 | 4.08 |

6. Conclusion

The use of translanguaging by excellent teachers in class shows not only individual differences, but also the characteristics of commonality and complexity. Excellent teachers tend to use different forms of language in a class, and the use of the target language (English) is definitely far more than the use of the learners' mother tongue. Both male and female teachers use different translanguaging in class. Both male and female teachers adopt the target language more than other forms of language. On the other hand, the distribution of different language forms and the frequency of different language forms used by different teachers are uneven, and the scope of fluctuation is also different.

As for gender differences, male and female teachers share some common points while showing differences. It can be seen that differences exist between male and female teachers in the amount and frequency of use of different language forms. Generally, in an EFL class, learners' mother tongue is far less used, or sometimes avoided intentionally by English teachers. Female teachers tend to use the target language more than male teachers, while the latter tend to use more body language than the former. Sometimes, different attitudes towards students' mother tongue appear among female teachers.

This study has attended to the questions of languages forms used by male and female teachers in classes and differences between male and female teachers in translanguaging. It is clear that different forms of language are involved in classes while the overall involvement of each form of language varies among teachers, and gender differences do exist in both the quantity and frequency of the involvement of language forms in classes. However, individual preferences of the involvement of language forms and the impacts of these differences upon students have not been covered in this study, so further investigations and discussions are necessary in the future for the study of translanguaging.

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Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

References

- Baker, W. (2021). English as a Lingua Franca, Translanguaging, and EMI in Asian Higher Education: Implications for Pedagogy. In W. Tsou, & W. Baker (Eds.), *English-Medium Instruction Translanguaging Practices in Asia* (pp. 21-38). Springer.
https://doi.org/10.1007/978-981-16-3001-9_2
- Bao, M., & Li, W. (2022). The Origin and Development of Translanguaging as a Practical

- Theory: An Interview with Professor Li Wei. *Foreign Languages in China*, 19, 64-68. (In Chinese) <https://doi.org/10.13564/j.cnki.issn.1672-9382.2022.03.013>
- Canagarajah, S. (2011). Translanguaging in the Classroom: Emerging Issues for Research and Pedagogy. *Applied Linguistics Review*, 2, 1-28. <https://doi.org/10.1515/9783110239331.1>
- Canagarajah, S. (2011). Translanguaging in the Classroom: Emerging Issues for Research and Pedagogy. *Modern Language Journal*, 95, 401-417. <https://doi.org/10.1111/j.1540-4781.2011.01207.x>
- DeMatthews, D., & Izquierdo, E. (2019). *Dual Language Education: Teaching and Learning in Two Languages*. Springer.
- García, O., & Leiva, C. (2014). Theorizing and Enacting Translanguaging for Social Justice. In A. Blackledge, & A. Creese (Eds.), *Heteroglossia as Practice and Pedagogy. Educational Linguistics* (Vol. 20, pp. 199-216). Springer. https://doi.org/10.1007/978-94-007-7856-6_11
- García, O., et al. (2014). *Translanguaging: Language, Bilingualism and Education*. Palgrave Macmillan.
- Jones, B. (2017). Translanguaging in Bilingual Schools in Wales. *Journal of Language, Identity and Education*, 16, 199-215. <https://doi.org/10.1080/15348458.2017.1328282>
- Kiramba, L., & Harris, V. J. (2019). Navigating Authoritative Discourses in a Multilingual Classroom: Conversations with Policy and Practice. *TESOL Quarterly*, 53, 456-481. <https://doi.org/10.1002/tesq.493>
- Lemke, J. L., & Lin, A. M. Y. (2022). Translanguaging and Flows: Towards an Alternative Conceptual Model. *Educational Linguistics*, 1, 134-151. <https://doi.org/10.1515/eduling-2022-0001>
- Leonet, O., Cenoz, J., & Gorter, D. (2020). Developing Morphological Awareness across Languages: Translanguaging Pedagogies in Third Language Acquisition. *Language Awareness*, 29, 41-59. <https://doi.org/10.1080/09658416.2019.1688338>
- Lewis, G., Jones, B., & Baker, C. (2021). Translanguaging: Developing Its Conceptualisation and Contextualisation. *Educational Research and Evaluation*, 18, 655-670. <https://doi.org/10.1080/13803611.2012.718490>
- Li, W. (2018). Translanguaging as a Practical Theory of Language. *Applied Linguistics*, 39, 9-30. <https://doi.org/10.1093/applin/amx039>
- Li, W., & García, O. (2017). From Researching Translanguaging to Translanguaging Research. In K. King, Y.-J. Lai, & S. May (Eds.), *Research Methods in Language and Education. Encyclopedia of Language and Education* (pp. 227-240). Springer. https://doi.org/10.1007/978-3-319-02249-9_16
- Liang, D. J., & Wang, P. (2020). Development of Translanguaging and Its Implications to Foreign Language Teaching. *Technology Enhanced Foreign Language Education*, No. 2, 86-92, 14. (In Chinese)
- Silverman, R. D. et al. (2017). Effects of a Cross-Age Peer Learning Program on the Vocabulary and Comprehension of English Learners and Non-English Learners in Elementary School. *Elementary School Journal*, 117, 485-512. <https://doi.org/10.1086/690210>
- Yuan, N. Y., & Zhou, E. (2015). Translanguaging Skills: Concept, Mechanism and Research. *Foreign Language World*, No. 2, 7-15. (In Chinese)

Appendix: Observation Sheets for Subjects

Language forms used by subjects are recorded on the classroom observation sheet (1 is for mother tongue, 2 for target language, 3 for body language and 4 for silence or pause) for the 25-minute class segment.

Table A1. Observation Sheet for T1.

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|----|------|------|---------|------|------|---------|------|---------|------|---------|
| 1 | 2 | 2 | 2 | 2 | 2, 3 | 2, 3 | 2 | 2, 3 | 2, 3 | 2, 3 |
| 2 | 2, 3 | 2, 3 | 2 | 2 | 2 | 2, 3 | 2, 3 | 2, 3 | 2 | 4 |
| 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4, 2 |
| 5 | 2, 3 | 2, 3 | 2 | 2 | 2, 3 | 2, 3 | 2, 3 | 2 | 2, 3 | 2, 3 |
| 6 | 2, 3 | 3, 2 | 3, 2 | 3, 2 | 4 | 4 | 4 | 4 | 4 | 4 |
| 7 | 4 | 4 | 4 | 4 | 4 | 4 | 2, 3 | 4 | 4, 2 | 2 |
| 8 | 2, 3 | 2, 3 | 2, 3 | 2, 3 | 4 | 4 | 4 | 4 | 4 | 4 |
| 9 | 4 | 4 | 4, 2, 3 | 2, 3 | 2, 3 | 2, 4 | 4, 1 | 4 | 2, 3 | 2, 3 |
| 10 | 2, 3 | 4, 2 | 2, 3 | 4, 3 | 4, 3 | 4, 3, 2 | 4 | 4, 2 | 2 | 2, 4 |
| 11 | 4, 2 | 2, 3 | 2, 4 | 4 | 2 | 2, 3 | 2 | 2, 3 | 4 | 4 |
| 12 | 4 | 4 | 4 | 4 | 4 | 4 | 4, 2 | 2, 3 | 2, 3 | 2, 3 |
| 13 | 2 | 2 | 2, 4 | 2 | 2, 3 | 2 | 2 | 2 | 2 | 2, 3 |
| 14 | 2, 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 2, 3 |
| 15 | 2 | 2, 3 | 2, 3 | 2, 4 | 2 | 2, 3 | 2, 3 | 2, 4 | 4, 2 | 2 |
| 16 | 2 | 2, 3 | 2, 3 | 2, 3 | 2, 3 | 2, 4 | 4, 2 | 2, 3 | 2, 3 | 2, 3 |
| 17 | 2, 3 | 2, 3 | 4 | 4, 2 | 4 | 4 | 4 | 4 | 4 | 4, 2, 3 |
| 18 | 2, 3 | 2, 3 | 2, 4 | 2, 4 | 2, 3 | 2, 3 | 2, 3 | 2, 3 | 2, 3 | 4 |
| 19 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| 20 | 4, 2 | 2, 3 | 4, 2 | 4, 2 | 4, 2 | 2, 3 | 2, 3 | 2, 3, 4 | 4 | 2, 3 |
| 21 | 2, 3 | 2, 3 | 2 | 2, 3 | 2, 3 | 2, 3 | 2, 3 | 2, 3 | 2, 3 | 2, 3 |
| 22 | 2, 3 | 4, 2 | 2, 3 | 2, 3 | 4 | 4 | 4 | 4 | 4 | 4 |
| 23 | 4 | 4 | 4 | 4 | 4 | 2, 3 | 2, 3 | 4 | 1, 4 | 4 |
| 24 | 4 | 4 | 4, 2 | 1, 3 | 4 | 4 | 4 | 4 | 4 | 4 |
| 25 | 4 | 4 | 4, 2, 3 | 2, 3 | 2, 3 | 2, 3 | 2, 3 | 2, 3 | 4 | 4 |

Table A2. Observation Sheet for T2.

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|------|------|------|------|------|------|------|------|------|------|
| 1 | - | - | 2, 3 | 2, 3 | 4 | 2, 3 | 2, 3 | 2, 3 | 2, 3 | 2, 3 |
| 2 | 4 | 2, 3 | 2, 4 | 2, 4 | 2, 3 | 2, 3 | 2, 4 | 2, 3 | 4, 2 | 4, 2 |
| 3 | 2, 3 | 2, 3 | 2, 3 | 2, 3 | 2, 3 | 2, 3 | 2, 3 | 2, 3 | 2, 3 | 2, 3 |
| 4 | 2, 3 | 4, 2 | 2, 3 | 2, 3 | 2, 3 | 2, 3 | 2, 3 | 2, 3 | 4, 2 | 2, 4 |

Continued

| | | | | | | | | | | |
|----|---------|------|------|---------|---------|---------|------|---------|---------|---------|
| 5 | 2, 3 | 2, 3 | 4, 2 | 4, 2 | 2, 3 | 4, 2 | 4, 2 | 4, 2 | 4, 2 | 2, 3 |
| 6 | 2, 3 | 2, 4 | 3, 2 | 2, 3 | 4, 2 | 2, 4 | 2, 4 | 2, 4 | 2, 3, 4 | 2, 4 |
| 7 | 2, 3 | 2, 3 | 4, 2 | 4, 2 | 2, 4 | 2, 3 | 2, 3 | 2, 3 | 2, 3 | 2, 3 |
| 8 | 2, 3 | 2, 3 | 2, 3 | 2, 3, 4 | 4, 2, 3 | 2, 3 | 2, 3 | 2, 3 | 4, 3 | 4, 3 |
| 9 | 4, 3 | 4, 3 | 4, 3 | 4, 3 | 2, 3 | 2, 3 | 4, 2 | 2, 3 | 2, 3 | 4, 2, 3 |
| 10 | 2, 3 | 2, 3 | 4, 3 | 2, 3 | 2, 3 | 2, 3 | 4, 2 | 4, 2, 3 | 2, 4 | 2, 4 |
| 11 | 2, 3 | 4, 2 | 2, 3 | 2, 3 | 4, 3 | 4, 2 | 2, 3 | 2, 3 | 4, 2 | 4, 3 |
| 12 | 2, 3 | 2, 3 | 2, 3 | 4, 3 | 4 | 2, 4 | 2, 4 | 4, 3 | 4, 2 | 4, 2 |
| 13 | 4, 3 | 4, 3 | 4, 2 | 2, 3 | 2, 4 | 2, 4 | 2, 3 | 2, 3 | 2, 4 | 2, 3 |
| 14 | 4, 2 | 2, 3 | 2, 3 | 2, 3 | 2, 3 | 2, 3 | 2, 3 | 2, 4 | 4, 3 | 2, 3 |
| 15 | 3, 2 | 2, 4 | 2, 3 | 2, 3 | 2, 3 | 2, 3 | 2, 3 | 2, 3 | 2, 3 | 2, 3 |
| 16 | 2, 3, 4 | 4, 3 | 4, 3 | 2, 3 | 2, 3 | 4, 3 | 4, 3 | 4, 3 | 4, 3 | 4, 3 |
| 17 | 2, 3 | 2, 3 | 4, 3 | 4, 3 | 4, 3 | 4, 3 | 4, 3 | 4, 3 | 4, 2, 3 | 2, 3 |
| 18 | 4, 2, 3 | 2, 3 | 4, 3 | 4 | 4 | 4 | 2, 3 | 2, 3 | 4, 3 | 4, 2 |
| 19 | 2, 3 | 2, 3 | 2, 3 | 2, 4 | 2, 3 | 2, 3, 4 | 4 | 2, 3 | 4 | 4 |
| 20 | 2, 4 | 4, 2 | 4 | 2 | 2, 3 | 4, 2 | 4 | 4, 2 | 2, 3 | 2, 3 |
| 21 | 2, 3 | 2, 3 | 2, 3 | 2, 3 | 2, 3 | 2, 3 | 2, 3 | 2, 3 | 2, 3 | 2, 3 |
| 22 | 2, 4 | 2, 3 | 4, 3 | 2, 3 | 2, 3 | 2, 3 | 2, 3 | 2, 3 | 2, 3 | 2, 3 |
| 23 | 2, 4 | 4 | 4 | 4 | 4 | 4 | 4, 3 | 2, 3 | 2, 3 | 2, 3 |
| 24 | 4, 3 | 4, 3 | 4, 3 | 4, 3 | 4, 3 | 4, 3 | 4, 3 | 4, 3 | 4, 3 | 4 |
| 25 | 4, 3 | 4, 3 | 4, 3 | 4, 3 | 4, 3 | 4, 3 | 2, 3 | 2, 3 | 4, 3 | 4, 3 |

Table A3. Observation Sheet for T3.

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|----|------|---------|------|------|---------|---------|---------|---------|---------|---------|
| 1 | 2, 3 | 4 | 2 | 2 | 2 | 2 | 2 | 4 | 4 | 4 |
| 2 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| 4 | 4, 2 | 4, 2 | 4, 2 | 4, 2 | 4, 2 | 4, 2 | 4 | 4 | 4 | 4 |
| 5 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 2, 3 | 4 |
| 6 | 2 | 2 | 2, 3 | 2, 3 | 2, 3 | 4, 2, 3 | 3, 2 | 2, 4 | 2, 3 | 2, 3 |
| 7 | 2, 3 | 2, 3 | 4 | 4 | 4 | 2, 3 | 4 | 4 | 4 | 4 |
| 8 | 4, 3 | 4, 2, 3 | 2, 3 | 2, 3 | 2, 3, 4 | 4, 3 | 4, 3 | 4, 3 | 4, 3 | 4, 3 |
| 9 | 4 | 4 | 4 | 4, 3 | 4, 3 | 4, 3 | 4, 3 | 4, 2, 3 | 2, 3 | 2, 3 |
| 10 | 2, 3 | 2, 4 | 2, 4 | 2, 4 | 2, 3 | 4, 2, 3 | 2, 4 | 4, 2 | 4, 2, 3 | 2, 3 |
| 11 | 2, 3 | 4, 3 | 2, 3 | 2, 3 | 2, 3 | 2, 3, 4 | 2, 3, 4 | 2, 3, 4 | 2, 3, 4 | 2, 3, 4 |
| 12 | 2, 4 | 2, 4 | 2, 4 | 2, 4 | 2, 4 | 2, 4 | 2, 4 | 2, 4 | 2, 4 | 2, 4 |
| 13 | 2, 4 | 2, 4 | 2, 4 | 2, 4 | 2, 4 | 2, 4 | 2, 4 | 2, 4 | 2, 4 | 2, 4 |
| 14 | 2, 4 | 2, 4 | 2, 4 | 2, 4 | 2, 4 | 2, 4 | 2, 4 | 2, 4 | 2, 4 | 2, 4 |

Continued

| | | | | | | | | | | |
|----|------|---------|------|------|------|------|------|------|---------|------|
| 15 | 2, 4 | 2 | 2 | 2 | 2 | 4 | 4 | 4 | 4 | 2 |
| 16 | 2 | 2 | 2, 4 | 2, 4 | 2 | 2 | 2 | 2 | 2 | 2 |
| 17 | 2 | 4 | 4, 2 | 4, 2 | 4 | 2 | 2 | 2 | 2 | 2 |
| 18 | 2 | 2, 3 | 2, 3 | 4 | 4 | 4 | 4 | 4 | 4, 2, 3 | 2 |
| 19 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 4 | 4, 2 |
| 20 | 2 | 2 | 2 | 2 | 2, 4 | 4, 2 | 2 | 2, 4 | 2, 4 | 4, 2 |
| 21 | 2 | 2 | 4, 2 | 4, 2 | 2, 4 | 2, 4 | 2, 4 | 2, 4 | 2, 4 | 2, 4 |
| 22 | 2, 4 | 4, 3 | 4, 3 | 4, 3 | 4, 3 | 4, 3 | 4, 3 | 4, 3 | 4, 3 | 2, 3 |
| 23 | 2, 3 | 4, 3 | 4, 3 | 4 | 4 | 4 | 4 | 4, 3 | 4, 3 | 4, 3 |
| 24 | 4, 3 | 4, 3 | 4, 3 | 4, 3 | 4, 3 | 4, 3 | 4, 3 | 4, 3 | 4 | 4 |
| 25 | 4, 3 | 4, 2, 3 | 4 | 4 | 4 | 4 | 2, 3 | 2, 3 | 4 | 4 |

Table A4. Observation Sheet for T4.

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|----|---------|---------|---------|---------|---------|---------|------------|---------|---------|---------|
| 1 | 4, 2, 3 | 2, 3 | 2, 3 | 3, 2 | 2, 3 | 3, 2 | 2, 3 | 2, 3 | 2, 3 | 2, 3 |
| 2 | 3, 2 | 2, 3 | 2, 3 | 2, 3 | 2, 3 | 2, 3 | 2, 3 | 2, 3 | 2, 3 | 2, 3 |
| 3 | 2, 3 | 2, 3 | 2, 3 | 2, 3 | 2, 3 | 2, 3 | 2, 3 | 4 | 2, 3 | 2, 3 |
| 4 | 2, 3 | 2, 3 | 4, 2 | 2, 3 | 2, 3 | 2, 3 | 4 | 2, 3 | 2, 3 | 2, 3 |
| 5 | 2, 3 | 4, 2, 3 | 2, 3 | 2, 3 | 2, 3 | 2, 3 | 1, 2, 3, 4 | 4, 3 | 4, 3 | 4, 3, 1 |
| 6 | 1, 2, 3 | 4 | 4 | 4 | 4, 2, 3 | 4 | 4 | 4 | 2, 3 | 2, 3 |
| 7 | 4 | 4 | 2, 3 | 2, 3 | 2, 3, 4 | 2, 3, 4 | 2, 3 | 2, 3 | 2, 3 | 2, 3 |
| 8 | 2, 3 | 2, 3, 4 | 2, 3, 4 | 2, 3, 4 | 2, 3, 4 | 4 | 4 | 4 | 2, 3 | 2, 3 |
| 9 | 2, 3, 4 | 2, 3 | 2, 3 | 2, 3, 4 | 2, 3, 1 | 1, 2, 3 | 2, 3 | 2, 3 | 2, 3 | 2, 3, 4 |
| 10 | 2, 3, 4 | 2, 3, 4 | 2, 3, 1 | 2, 3 | 2, 3, 4 | 4, 2 | 4, 2 | 2, 1, 3 | 2, 3 | 2, 3 |
| 11 | 2, 3, 4 | 2, 3, 4 | 2, 3, 1 | 2, 3, 1 | 2, 3 | 1 | 1, 2, 3 | 4, 2, 3 | 2, 3, 4 | 2, 3, 4 |
| 12 | 2, 3, 4 | 4 | 2, 3 | 2, 3, 1 | 2, 3 | 2, 3, 4 | 2, 3, 4 | 2, 3, 4 | 2, 3, 4 | 2, 3, 4 |
| 13 | 2, 3, 4 | 2, 3, 4 | 2, 3, 4 | 2, 3, 4 | 1 | 4, 3, 2 | 1, 4, 2 | 2, 3, 4 | 2, 3, 1 | 2, 3, 4 |
| 14 | 2, 3, 4 | 1, 2, 3 | 2, 3, 1 | 1, 2, 3 | 2, 3, 4 | 2, 3, 4 | 2, 3, 4 | 2, 3, 4 | 2, 3, 4 | 2, 3 |
| 15 | 2, 3, 1 | 2, 3 | 4, 1 | 2, 3, 4 | 2, 3, 4 | 2, 3, 4 | 2, 3, 4 | 2, 3, 4 | 2, 3, 4 | 2, 3, 4 |
| 16 | 2, 3, 4 | 2, 3, 4 | 2, 3 | 2, 3, 1 | 2, 3 | 2, 3, 1 | 2, 3, 4 | 2, 3, 4 | 2, 3, 4 | 2, 3 |
| 17 | 2, 3, 1 | 4, 3, 1 | 4, 3, 1 | 4, 3, 1 | 4, 3, 1 | 4, 3, 1 | 4, 3, 1 | 4, 3, 1 | 4, 3, 1 | 4, 3 |
| 18 | 2, 3 | 2, 3, 4 | 4, 2, 3 | 2, 3 | 4, 2, 3 | 2, 3, 1 | 2, 3 | 2, 3 | 2, 3, 4 | 4, 2, 3 |
| 19 | 2, 3, 4 | 2, 3, 4 | 2, 3, 4 | 2, 3, 4 | 2, 3, 1 | 2, 3 | 2, 3, 4 | 2, 3, 4 | 4, 2, 3 | 2, 3, 1 |
| 20 | 1, 2, 3 | 2, 3, 4 | 2, 3, 4 | 1, 2, 3 | 2, 3, 4 | 2, 3, 1 | 4, 2 | 2, 3, 4 | 2, 3, 1 | 1, 2, 3 |
| 21 | 1, 2, 3 | 2, 3, 4 | 2, 3, 4 | 2, 3, 4 | 2, 3 | 1 | 2, 3, 4 | 4, 2, 3 | 4, 2, 3 | 2, 3, 4 |
| 22 | 4, 2 | 1, 2, 3 | 2, 3, 4 | 4, 2, 3 | 4, 2, 1 | 2, 3, 4 | 2, 3, 4 | 2, 3, 4 | 2, 3, 4 | 2, 3, 4 |
| 23 | 2, 3, 4 | 2, 3, 1 | 2, 3, 1 | 1, 2, 3 | 2, 3, 4 | 2, 3, 4 | 2, 3, 4 | 2, 3, 4 | 2, 3, 4 | 2, 3, 4 |
| 24 | 2, 3, 4 | 2, 3, 1 | 2, 3, 4 | 4, 2, 3 | 4, 3, 2 | 4, 3, 2 | 2, 3, 4 | 2, 3, 4 | 2, 3, 4 | 2, 3, 1 |
| 25 | 2, 3 | 2, 3, 4 | 2, 3, 4 | 1, 2, 3 | 2, 3, 4 | 4, 2, 3 | 4, 2, 3 | 1, 3 | 4, 2 | 4, 2, 3 |

Table A5. Observation Sheet for T5.

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|----|---------|------------|---------|---------|---------|------------|---------|---------|---------|------------|
| 1 | - | 2, 3 | 2, 3 | 3, 2 | 2, 3 | 2, 3 | 2, 3 | 2, 3 | 2, 3 | 2 |
| 2 | 2, 3 | 4 | 4 | 4 | 2, 3 | 2, 3 | 2, 3, 4 | 2, 3 | 2, 3 | 4, 2, 3 |
| 3 | 2, 3 | 2, 3 | 2, 3 | 4, 2, 3 | 2, 3, 4 | 2, 3, 4 | 4 | 2, 4, 3 | 2, 3, 4 | 4, 2, 3 |
| 4 | 2, 3, 4 | 2, 3 | 2, 3, 4 | 2, 3, 4 | 2, 3, 4 | 4 | 2, 4 | 2, 4 | 2, 3 | 2, 3 |
| 5 | 1, 4 | 4, 1 | 1, 4 | 1, 4 | 1, 4 | 1, 4 | 1, 3, 4 | 1, 2, 4 | 1, 3, 4 | 1, 2, 4 |
| 6 | 1, 4 | 1, 2, 4, 3 | 2, 3 | 2, 3, 4 | 2, 3, 4 | 2, 3, 4 | 2, 3 | 2, 3 | 2, 3 | 2, 3 |
| 7 | 2, 4 | 2, 3 | 2, 3 | 2, 3 | 2, 3 | 2, 3, 4 | 2, 3, 4 | 2, 4 | 2, 3, 4 | 2, 3, 4 |
| 8 | 2, 4 | 2, 4 | 2, 4 | 2, 4, 3 | 2, 3 | 2, 3 | 2, 3, 4 | 2, 3, 4 | 2, 3 | 2, 3 |
| 9 | 2, 3 | 2, 3, 4 | 2, 3 | 2, 3 | 2, 3 | 2, 3 | 2, 3 | 2, 3, 4 | 2, 3, 4 | 2, 3, 4 |
| 10 | 2, 3 | 2, 3, 4 | 2, 3, 4 | 2, 3, 4 | 2, 3, 4 | 2, 3 | 2, 3 | 2, 3 | 2, 3 | 2, 3 |
| 11 | 2, 3 | 2, 3, 4 | 2, 3, 4 | 2, 4 | 2, 3, 4 | 2, 3, 4 | 2, 3, 4 | 2, 3 | 2, 3, 4 | 2, 3, 4 |
| 12 | 2, 4 | 2, 4 | 2, 4 | 2, 4 | 2, 3, 4 | 2, 3, 4 | 2, 3, 4 | 2, 4 | 2, 3, 4 | 2, 3, 4 |
| 13 | 2, 3, 4 | 2, 4 | 2, 3 | 2, 4 | 2, 4 | 2, 4 | 2, 4 | 2, 4 | 4 | 4 |
| 14 | 4 | 4 | 2, 3, 4 | 2, 3 | 2, 3, 4 | 2, 3, 4 | 2, 3, 4 | 2, 3, 4 | 2, 3 | 2, 4 |
| 15 | 4 | 4 | 4 | 2, 3 | 2, 3, 4 | 2, 3, 4 | 2, 3, 4 | 2, 3, 4 | 2, 3, 4 | 2, 3, 4 |
| 16 | 2, 3 | 4 | 4, 2 | 4, 2 | 2, 3 | 2, 3, 4 | 2, 3, 4 | 2, 3, 4 | 2, 3 | 2, 3 |
| 17 | 2, 4 | 1, 4 | 2, 1, 4 | 1, 4, 2 | 1, 4, 2 | 1, 4, 2 | 2, 4 | 2, 4 | 2, 4 | 2, 4 |
| 18 | 2, 4 | 2, 4 | 2, 4, 3 | 2, 4 | 2, 4 | 2, 4 | 2, 3, 4 | 2, 3 | 2, 3, 1 | 3 |
| 19 | 3, 2 | 2 | 1, 2, 3 | 2, 4, 3 | 2, 3, 4 | 2, 3, 4 | 2, 3, 4 | 2, 3, 4 | 4 | 4, 2, 3 |
| 20 | 2, 3, 4 | 2, 3, 4 | 4, 2 | 2, 4 | 2, 3, 4 | 2, 4 | 2, 4 | 4, 2, 3 | 2, 3, 4 | 2, 3, 4 |
| 21 | 2, 3, 4 | 2, 3, 4, 1 | 4, 3 | 2, 3, 4 | 4 | 2, 4 | 2, 3, 4 | 2, 3 | 3, 4 | 3, 4 |
| 22 | 2, 1, 4 | 2, 3 | 2, 1, 3 | 3, 4, 2 | 2, 3, 4 | 3, 2, 4, 1 | 1, 3 | 1, 3 | 1, 3 | 1, 2, 3 |
| 23 | 1, 4, 3 | 1, 3, 4 | 2, 3, 4 | 2, 3, 4 | 2, 4, 3 | 3, 2, 4 | 2, 3, 4 | 2, 3, 4 | 1, 3, 4 | 1, 2, 3, 4 |
| 24 | 2, 3 | 2, 3 | 2, 3 | 3, 4 | 3, 4, 2 | 3, 4 | 4 | 2, 4 | 4, 2 | 2, 4 |
| 25 | 2, 3 | 2, 3, 4 | 2, 3, 4 | 1, 2, 4 | 2, 3 | 2, 3 | 2, 3, 1 | 1, 4 | 2, 1, 4 | 1, 2, 4 |

Table A6. Observation Sheet for T6.

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|------|---|------|------|------|---|------|---|------|------|
| 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 2 | 2 | 2 | 2 | 2 | 4 | 2 | 2 | 2 | 2 | 2, 3 |
| 3 | 2, 3 | 4 | 4, 2 | 4 | 2 | 2 | 2 | 2 | 2, 4 | 2 |
| 4 | 2 | 2 | 4 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 5 | 2 | 2 | 2 | 2 | 2, 3 | 4 | 2 | 2 | 2, 4 | 4 |
| 6 | 2 | 2 | 2, 4 | 4, 2 | 2 | 4 | 2 | 2 | 2 | 2 |
| 7 | 2 | 2 | 2 | 2 | 2 | 2 | 2, 4 | 2 | 2, 4 | 2 |

Continued

| | | | | | | | | | | |
|----|------|------|------|------|------|------|------|------|------|------|
| 8 | 2 | 2, 4 | 2 | 2 | 2 | 2 | 2 | 2, 4 | 2, 3 | 4, 2 |
| 9 | 2 | 2 | 2 | 2, 3 | 4, 2 | 4, 2 | 2 | 2, 4 | 2 | 2 |
| 10 | 2 | 2 | 2 | 2, 3 | 2 | 2 | 2 | 2 | 2 | 2, 4 |
| 11 | 2 | 2 | 2 | 4 | 2, 4 | 4 | 4, 2 | 2 | 2 | 4 |
| 12 | 2 | 2 | 2, 4 | 4 | 4, 2 | 4, 2 | 2 | 2, 3 | 4 | 2 |
| 13 | 2 | 2 | 2 | 2 | 2 | 2, 3 | 2 | 2 | 4 | 2, 4 |
| 14 | 2 | 2 | 2 | 4 | 4 | 4 | 4 | 4 | 4 | 2 |
| 15 | 2, 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| 16 | 4 | 4 | 2 | 4 | 4 | 4 | 2 | 2 | 2 | 2, 4 |
| 17 | 2 | 2, 4 | 2 | 2 | 2 | 4 | 2 | 2 | 2 | 2 |
| 18 | 2 | 4 | 4, 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2, 4 |
| 19 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 20 | 2 | 2 | 2 | 2, 3 | 2, 3 | 2 | 2 | 2 | 2 | 2 |
| 21 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 4 |
| 22 | 4 | 4, 2 | 2, 4 | 4 | 2 | 2 | 2 | 4 | 4 | 4 |
| 23 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4, 2 |
| 24 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| 25 | 4 | 4 | 2, 4 | 4 | 4 | 4, 2 | 2 | 2 | 2 | 2 |

Table A7. Observation Sheet for T7.

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|----|---------|---------|------|---------|---------|---------|---------|---------|---------|---------|
| 1 | 2 | 2, 3 | 2 | 2 | 2, 3 | 2, 3 | 2, 4 | 2, 4 | 2 | 2, 4 |
| 2 | 2, 4 | 2, 4 | 2, 4 | 2, 4 | 2, 4 | 2 | 2 | 2 | 2 | 2 |
| 3 | 2 | 2 | 2 | 2, 4 | 4, 2 | 2, 4 | 4, 2 | 4, 2 | 2 | 2 |
| 4 | 2 | 2 | 2 | 2 | 2 | 2, 4 | 2, 4 | 2 | 2, 4 | 2 |
| 5 | 2, 4 | 2, 3 | 2, 3 | 2 | 2, 3 | 2, 3 | 2, 3 | 2, 3 | 2 | 2, 4 |
| 6 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| 7 | 4 | 4 | 4, 3 | 4, 3 | 4, 3 | 4, 3 | 4, 3 | 4 | 4, 3 | 4, 3 |
| 8 | 4, 2 | 2 | 2 | 2, 3, 4 | 2, 3, 4 | 4, 2 | 2, 3, 4 | 2, 4, 3 | 2, 3, 4 | 2, 3, 4 |
| 9 | 2, 4 | 2, 4 | 2, 3 | 2, 3 | 2, 3, 4 | 2, 4 | 4 | 2, 3, 4 | 2, 3, 4 | 2, 3 |
| 10 | 2, 4 | 4, 2 | 2, 4 | 4, 2 | 2 | 2, 4 | 2, 3 | 2, 4 | 2, 3 | 2, 3, 4 |
| 11 | 2, 3, 4 | 2, 3, 4 | 2 | 2 | 2, 4 | 2, 3, 4 | 2, 4 | 2, 4 | 2 | 2, 4 |
| 12 | 2 | 2 | 2, 4 | 4, 2 | 4, 2 | 4, 2 | 4, 2 | 2, 4 | 2, 4 | 2, 4 |
| 13 | 2, 4 | 2 | 2 | 2, 4 | 4 | 2, 4 | 2, 4 | 2 | 2 | 2, 4 |
| 14 | 2, 4 | 4, 2 | 4 | 2, 4 | 2, 4 | 2 | 2, 4 | 4, 2 | 4 | 2 |
| 15 | 2, 4 | 2 | 2 | 2 | 2 | 2, 4 | 2, 4 | 2, 4 | 2, 3, 4 | 2, 4 |
| 16 | 2, 4 | 4, 2, 3 | 2, 3 | 2, 4 | 2, 3, 4 | 2, 4 | 2, 3 | 2, 3, 4 | 2, 4 | 2, 4 |

Continued

| | | | | | | | | | | |
|----|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 17 | 2, 3, 4 | 2, 3, 4 | 2, 4 | 2, 4 | 2, 4 | 2, 4 | 2, 4 | 2, 3, 4 | 2, 3, 4 | 2, 3, 4 |
| 18 | 2, 3, 4 | 2, 3, 4 | 2, 3, 4 | 2, 3, 4 | 2, 3, 4 | 2, 4 | 4, 2, 3 | 2, 3, 4 | 2, 4, 1 | 2, 4 |
| 19 | 2, 3 | 2, 3 | 2, 4 | 2, 3, 4 | 2, 3, 4 | 1, 2, 3 | 2, 3 | 2, 4 | 2, 4 | 2, 4 |
| 20 | 2, 4 | 2, 4 | 2, 3, 4 | 2, 3, 4 | 2, 3, 4 | 2, 4 | 2, 4 | 2, 4 | 2, 4 | 2, 4 |
| 21 | 2, 4 | 2, 3 | 2, 4 | 2, 3 | 2, 4 | 2, 4 | 2, 4 | 2, 4 | 2, 3, 4 | 2, 4 |
| 22 | 2, 3, 4 | 2, 4 | 2, 4 | 2, 4 | 2, 4 | 2, 4 | 2, 3 | 2, 3 | 2, 3 | 2, 3 |
| 23 | 2 | 2, 3 | 2, 3, 4 | 2, 3, 4 | 4, 2 | 2, 3, 4 | 2, 4 | 2 | 2, 4 | 2, 4 |
| 24 | 2, 4 | 4, 2 | 2, 3, 4 | 2 | 2, 4 | 2 | 2 | 2 | 2, 4 | 2 |
| 25 | 2 | 2 | 2 | 2 | 2 | 2, 4 | 2, 4 | 2, 3 | 4 | 4 |

Table A8. Observation Sheet for T8.

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|----|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 1 | - | 2 | 2 | 2 | 2 | 2, 4 | 4 | 4 | 4, 3 | 3, 4 |
| 2 | 3, 4 | 3, 4 | 3, 4 | 3, 4 | 3, 4 | 3, 4 | 3, 4 | 4, 3 | 4, 3 | 4, 3 |
| 3 | 4, 3 | 4, 3 | 4, 3 | 4, 3 | 4, 3 | 4 | 4 | 4 | 4, 3 | 4 |
| 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4, 3 | 4 | 4 | 4 |
| 5 | 4 | 4 | 4 | 4, 3 | 2, 3 | 2 | 2 | 2 | 2 | 2, 4 |
| 6 | 2 | 2 | 2 | 2, 3 | 2 | 2 | 2 | 2 | 2 | 2, 4 |
| 7 | 4 | 4, 3 | 4, 3 | 4, 3 | 4, 3 | 4, 3 | 4, 3 | 4, 3 | 4, 3 | 4, 3 |
| 8 | 4, 3 | 4, 3 | 4, 3 | 4, 3 | 4, 3 | 4, 3 | 4, 3 | 4, 3 | 4 | 4 |
| 9 | 4, 3 | 4, 3 | 4, 3 | 4, 3 | 4, 3 | 4, 3 | 4, 3 | 4, 3 | 4 | 4 |
| 10 | 4, 2 | 2, 3 | 4, 2 | 2, 3, 4 | 2, 3, 4 | 2, 3 | 2, 4, 3 | 2, 3, 4 | 2 | 2 |
| 11 | 2, 3, 4 | 4, 2 | 2, 4 | 2, 3, 4 | 2, 3, 4 | 2, 3, 4 | 4, 2 | 2, 4 | 4, 2 | 4, 2 |
| 12 | 2 | 2, 4 | 4, 2 | 2 | 2 | 3, 2 | 2, 3, 4 | 4, 2 | 2, 3 | 2, 3 |
| 13 | 2, 3 | 2, 3 | 2, 3 | 2, 4 | 2, 3 | 2, 3, 4 | 2, 3, 4 | 2, 4 | 2 | 2 |
| 14 | 2 | 2 | 2, 4 | 2, 4 | 3, 4 | 3, 4 | 4 | 4 | 2, 3 | 4, 3 |
| 15 | 2, 3 | 2 | 3, 4 | 3, 4 | 3, 4 | 3, 4 | 3, 4 | 3, 4 | 3, 4 | 3, 4 |
| 16 | 3, 4 | 3, 4 | 3, 4 | 3, 4 | 3, 4 | 3, 4 | 3, 4 | 3, 4 | 4, 3 | 3, 4 |
| 17 | 3, 4 | 3, 4 | 3, 4 | 3, 4 | 3, 4 | 3, 4 | 3, 4 | 3, 4 | 3, 4 | 4, 3 |
| 18 | 4 | 2 | 3, 4 | 4, 3 | 4, 3 | 3, 4 | 3, 4 | 3, 4 | 3, 4 | 4 |
| 19 | 2 | 2, 3, 4 | 4, 2 | 2, 3, 4 | 4 | 2, 3 | 2, 3, 4 | 4, 2 | 2 | 2, 3, 4 |
| 20 | 4, 2 | 2 | 2, 3, 4 | 4 | 2 | 2, 4, 3 | 4, 3 | 4, 2 | 2, 4, 3 | 2, 3 |
| 21 | 2, 4 | 4, 2 | 2, 4 | 2, 3 | 2, 3 | 4, 3 | 4, 3 | 3, 4 | 3, 4 | 3, 4 |
| 22 | 3, 4 | 3, 4 | 3, 4 | 3, 4 | 3, 4 | 3, 4 | 3, 4 | 3, 4 | 3, 4 | 3, 4 |
| 23 | 3, 4 | 3, 4 | 3, 4 | 3, 4 | 3, 4 | 3, 4 | 3, 4 | 3, 4 | 3, 4 | 3, 4 |
| 24 | 3, 4 | 3, 4 | 3, 4 | 3, 4 | 3, 4 | 3, 4 | 3, 4 | 3, 4 | 3, 4 | 3, 4 |
| 25 | 4, 3 | 4 | 4 | 4 | 4, 3 | 3, 4 | 4, 2 | 2 | 2, 4 | 4 |

Table A9. Observation Sheet for T9.

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|----|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 1 | 2, 3 | 2, 3 | 2, 3 | 2, 3 | 2, 3 | 2, 3 | 2, 3 | 2, 3 | 2, 3 | 2, 4 |
| 2 | 2 | 2, 4 | 2, 4 | 2, 4 | 2, 4 | 2, 4 | 2, 4 | 2, 4 | 2, 4 | 2, 4 |
| 3 | 2, 4 | 2, 4 | 2, 4 | 2, 3, 4 | 2, 4 | 2, 4 | 2, 4 | 2, 4 | 2, 4 | 2, 4 |
| 4 | 2, 4 | 2, 4 | 2 | 2, 4 | 2 | 2, 4 | 2 | 2, 3, 4 | 2, 4 | 2, 3, 4 |
| 5 | 2, | 2, 3 | 2, 3 | 2, 3, 4 | 2, 3, 4 | 2, 4 | 2, 4 | 2, 4 | 2, 4 | 2, 4 |
| 6 | 2, 4 | 2, 4 | 2, 4 | 2, 4 | 2, 4 | 2, 3 | 2, 3 | 2, 3 | 2, 4 | 2, 3, 4 |
| 7 | 2, 4 | 4 | 4, 3 | 4, 2, 3 | 2, 4 | 2, 4 | 2, 3, 4 | 2, 3 | 2, 3, 4 | 4, 2 |
| 8 | 4, 2 | 2, 3, 4 | 2, 4 | 4 | 4, 2 | 2, 4 | 4, 2 | 2, 4 | 4, 2 | 4, 2 |
| 9 | 2, 3 | 2, 4 | 2, 4 | 2, 4 | 2, 4 | 4, 2, 3 | 2, 3, 4 | 2, 3, 4 | 2, 3 | 2, 3, 4 |
| 10 | 2, 4 | 2, 3, 4 | 2, 4 | 2, 4 | 2, 4 | 2, 4 | 2, 4 | 2, 4 | 2, 4 | 2, 4 |
| 11 | 2, 4 | 2, 4 | 2, 4 | 2, 4 | 2, 3 | 2, 4 | 2, 3, 4 | 2, 3, 4 | 2, 3 | 2, 3 |
| 12 | 2, 3 | 2, 3, 4 | 2, 3, 4 | 2, 4 | 2, 4 | 2, 4 | 2, 4 | 2, 4 | 2, 1, 4 | 2, 4 |
| 13 | 2, 4 | 2, 3, 4 | 2, 4 | 2, 4 | 2, 4 | 2, 3, 4 | 4, 2 | 4, 2 | 4, 2, 3 | 2, 3, 4 |
| 14 | 4, 2 | 4, 2 | 2, 3 | 2, 3, 4 | 2, 4 | 2, 3, 4 | 2, 4 | 2, 4 | 2, 4 | 2, 4 |
| 15 | 2, 4 | 2, 4 | 4, 2 | 2, 4 | 2, 4 | 2, 4 | 2, 4 | 2, 4 | 2, 3 | 2, 3 |
| 16 | 2, 4 | 2, 3 | 2, 3 | 2, 3, 4 | 2, 3, 4 | 4, 2 | 4, 2, 3 | 4, 3, 2 | 4, 3 | 2, 3, 4 |
| 17 | 2, 4 | 2 | 2, 3, 4 | 2, 4 | 4, 2 | 4, 2, 3 | 4, | 2, 4 | 4, 2 | 2, 3 |
| 18 | 2, 4 | 4, 2 | 2, 3 | 2, 4 | 4, 2 | 4, 2 | 2, 4 | 2, 4 | 2, 4 | 2, 4 |
| 19 | 2, 1, 4 | 2 | 2, 1, 4 | 2, 1 | 2, 1 | 1 | 2, 1 | 2, 4 | 4 | 4 |
| 20 | 2 | 2, 3 | 2, 3 | 2, 3 | 2, 4 | 4, 2 | 2, 4 | 4 | 4, 2, 3 | 4 |
| 21 | 4 | 4 | 4, 2, 3 | 2, 3 | 2, 4 | 2, 4 | 2, 4 | 2, 3 | 2 | 2, 3 |
| 22 | 2 | 2, 4 | 2 | 2, 3 | 2, 3 | 2, 3 | 2, 3 | 2, 3 | 2, 3, 4 | 2, 3 |
| 23 | 2, 3 | 2, 3 | 2, 3, 4 | 2, 3, 1 | 2, 3 | 2, 3 | 2, 3, 4 | 2, 3, 4 | 2, 3, 4 | 4, 2, 3 |
| 24 | 2, 3, 4 | 2, 3, 4 | 2, 3, 4 | 2, 3, 4 | 2, 3 | 2, 3 | 2, 3 | 2, 3 | 2, 3 | 2, 3 |
| 25 | 2, 3 | 2, 3 | 2, 3 | 2, 3 | 2, 3, 1 | 2, 3 | 4 | 4 | 4 | 4 |

Table A10. Observation sheet for T10.

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---------|---------|---------|---------|---------|---------|----------|---------|---------|---------|
| 1 | 2, 3 | 4, 3 | 2, 3, 4 | 2, 3, 4 | 2, 3, 4 | 2, 3, 4 | 2, 3, 4. | 2, 3, 4 | 2, 3, 4 | 2, 3, 4 |
| 2 | 2, 3, 4 | 2, 3, 4 | 2, 3, 4 | 2, 3, 4 | 2, 3, 4 | 2, 3, 4 | 2, 3, 4 | 2, 3, 4 | 2, 3, 4 | 2, 3, 4 |
| 3 | 2, 3, 4 | 2, 3, 4 | 2, 3 | 2, 3, 4 | 2, 3, 4 | 2, 3, 4 | 2, 3, 4 | 2, 3, 4 | 2, 3, 4 | 2, 3, 4 |
| 4 | 2, 3, 4 | 2, 3, 4 | 2, 3 | 2, 3 | 2, 3 | 1, 2, 3 | 4, 2 | 2 | 2 | 2 |
| 5 | 2 | 2, 3 | 2, 4 | 2, 3 | 2, 3 | 2, 3 | 2, 3 | 2, 3 | 2, 3 | 2 |
| 6 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 2, 3 | 2, 3 | 4, 2 |
| 7 | 2, 3 | 2, 3 | 2, 3 | 2, 3 | 2 | 2, 3, 4 | 2, 3, 4 | 2, 3, 4 | 2, 3, 4 | 2, 3, 4 |
| 8 | 1, 3 | 1, 3 | 2, 3 | 2, 3 | 2, 3 | 2, 3, 4 | 2, 3, 4 | 2, 3, 4 | 2, 3, 4 | 2, 3 |

Continued

| | | | | | | | | | | |
|----|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 9 | 2, 3 | 2, 3 | 2, 3 | 2, 3 | 2, 3 | 4, 3 | 2, 3 | 2, 3 | 2, 3 | 2, 3 |
| 10 | 2, 3 | 2, 3 | 2, 3 | 2, 3 | 2, 3 | 4, 3 | 4, 3 | 4, 3 | 4, 3 | 4, 2, 3 |
| 11 | 2, 3 | 2, 3, 4 | 4 | 4 | 2, 3 | 4 | 4 | 4 | 2, 3 | 2, 3 |
| 12 | 2, 3 | 4, 3 | 2, 3 | 2, 3 | 2, 3 | 4 | 4 | 4 | 4 | 4, 2, 3 |
| 13 | 2, 3 | 4 | 4 | 4 | 2, 3 | 2, 3, 4 | 2, 3, 4 | 2, 3, 4 | 2, 3, 4 | 2, 3, 4 |
| 14 | 2, 3 | 2, 3 | 2, 3, 4 | 2, 3, 4 | 2, 3, 4 | 2, 3, 4 | 2, 3, 4 | 2, 3, 4 | 2, 3, 4 | 2, 3, 4 |
| 15 | 2, 3, 4 | 2, 3 | 2, 3 | 2, 3 | 2, 3 | 2, 3 | 1, 2, 3 | 4 | 4, 3 | 2, 3, 4 |
| 16 | 4 | 4 | 4 | 4 | 4 | 2, 3 | 2, 3 | 2, 3, 4 | 4 | 2, 3, 4 |
| 17 | 4 | 2, 3, 4 | 4 | 2, 3 | 2, 3 | 4 | 4 | 2, 3 | 2, 3 | 2, 3 |
| 18 | 2, 3 | 2, 3 | 4 | 4 | 2, 3 | 4 | 4, 2 | 4 | 4, 2 | 2, 3 |
| 19 | 2, 3, 4 | 4 | 4 | 4, 2 | 4 | 2, 3, 4 | 4 | 4, 2, 3 | 4 | 4 |
| 20 | 4 | 2, 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 4 |
| 21 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 2 | 2, 3 | 4, 2 |
| 22 | 2, 3 | 2, 4 | 4, 3 | 4, 3 | 4, 3 | 4, 3 | 4 | 4 | 4 | 2 |
| 23 | 2 | 2, 3, 1 | 2, 3, 4 | 2, 3, 4 | 2, 3, 4 | 2, 3, 4 | 2, 3, 4 | 2, 3, 4 | 2, 3 | 2, 3, 1 |
| 24 | 1, 2, 3 | 1, 3 | 1, 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| 25 | 2, 3 | 2, 3 | 2, 3, 4 | 2, 3, 4 | 2, 3, 4 | 2, 3 | 4, 3 | 4, 3 | 4, 3 | 2 |