Primary Teachers' Knowledge Base of Pronunciation Instruction: Their Content Knowledge, Pedagogical Content Knowledge, and Technical Pedagogical Content Knowledge

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Kim, Jiyeon. (2023). Primary teachers' knowledge base of pronunciation instruction: Their content knowledge, pedagogical content knowledge, and technical pedagogical content knowledge. *English Teaching, 78*(4), 83-111.

This study investigated primary teachers' knowledge of pronunciation instruction, and its manifestation in classroom practices in Korean EFL contexts. To this end, the questionnaire data collected from 47 teachers were quantitatively analyzed. The emerging themes from 5 teachers' interviews were qualitatively analyzed, based on content analysis. Findings revealed that they had an appropriate knowledge base of pronunciation teaching, equipped with the better understanding of content knowledge (CK), followed by pedagogical content knowledge (PCK), and technical pedagogical content knowledge (TPACK). No statistically significant difference was found in teachers' knowledge between males and females, and also between the 4 groups with different teaching experience. They manifested their knowledge mainly acquired from the past course lectures into classroom practices, employing controlled and free practices such as listening and repeating, shadowing, songs, chants, games, and role play, including different types of corrective feedback. Most notably, they integrated role play effectively into classroom practices to improve young learners' pronunciation in interest-provoking and enjoyable ways.

Keywords: teachers' knowledge, pronunciation instruction, classroom practices, controlled and free practices

1. INTRODUCTION

In the past few decades, the study of teacher cognition has received considerable attention in the second or foreign language teacher education. Central to teacher cognition study are explorations of teachers' thought processes (Clark & Petersen, 1986), their knowledge and beliefs, the interplay between their cognition and actual classroom practices, changes in beliefs, development of knowledge and beliefs, and the impacts of teacher education and professional development programs on their cognition (Borg, 2006, 2017, 2018).

Numerous studies of ESL/EFL teachers' cognition have mainly concerned with teachers' cognition about the teaching of four language skills, listening, speaking, reading, and writing, including grammar, and vocabulary. In comparison, research into ESL/EFL teachers' knowledge about pronunciation teaching has largely unexplored, apart from the limited amount of research into effective pronunciation techniques, or some issues in pronunciation teaching like prioritizing segmentals or suprasegmentals (Baker, 2011, 2014; Baker & Murphy, 2011; Burri, 2015; Couper, 2017; Derwing & Munro, 2015; Kochem, 2022).

To date, relatively few studies have been conducted regarding primary teachers' knowledge about English pronunciation teaching in Korean EFL classrooms, i.e., what knowledge they have to teach pronunciation effectively, and how they put their knowledge into actual practices in primary English classrooms. Thus, this study aims to investigate Korean primary teachers' knowledge base for English pronunciation teaching and its manifestation in classroom practices.

It is of value to explore primary teachers' knowledge about effective pronunciation instruction, because not only does their knowledge about pronunciation teaching serve as a filter through which instructional judgments decisions are made (Phipps & Borg, 2009), but it also powerfully affects students' pronunciation improvement for enhancing their communication skills. In addition, insights into the knowledge base for pronunciation instruction will also help primary teachers build confidence and develop their knowledge base in this area, who have been reluctant to teach English pronunciation due to a lack of confidence or knowledge of what and how to teach pronunciation in primary classrooms.

In order to examine primary teachers' knowledge about pronunciation teaching and their practices, this study will address the following two research questions:

1) What knowledge do Korean primary teachers have about English pronunciation instruction?
2) How is Korean primary teachers' knowledge about pronunciation instruction manifested in their classroom practices?

2. LITERATURE REVIEW

2.1. ESL/EFL Teachers' Knowledge Base

Since Shulman (1986, 1987) proposed seven categories of teacher knowledge such as content knowledge, general pedagogical knowledge, curriculum knowledge, pedagogical content knowledge, knowledge of learners and their characteristics, knowledge of educational contexts, and knowledge of educational ends, numerous studies have attempted to present a reconceptualization of teacher knowledge in ESL/EFL teacher education, drawing on his categorization of teacher knowledge.

For example, Day (1993) claims that the knowledge base of L2 teacher education consists of four categories of knowledge, content knowledge, pedagogic knowledge, pedagogic content knowledge, support knowledge. Based on the four categories of knowledge, he discusses the ways in which knowledge is presented or delivered to learners.

Johnson (2009) also points out that the knowledge base of L2 teacher education programs should involve three areas, what L2 teachers need to know, how L2 teachers should teach, and how L2 teachers learn to teach. It includes L2 teachers' knowledge of the content and pedagogy that are taught and reflected in classroom instructional practices as well as understanding of how they learn to do their work.

Additionally, Richards (2015) maintains that disciplinary knowledge and pedagogical content knowledge provide a knowledge base for L2 language teaching. The former refers to know about what they teach, which is thought of as constituting the theoretical foundations of ESL/ELT, while the latter refers to knowledge of practical skills of language teaching.

Freeman (2020), who has proposed a more concrete framework for second language teacher education, suggests that current ELT knowledge base address the following five areas: "what is taught, who is teaching it, who are learning it and why, how it is being taught, and how teachers are being prepared and supported in teaching" (p. 9). In a similar vein, Baker (2022) notes that TESOL teachers need to know four domains of knowledge to teach L2 oral communication effectively, subject matter content knowledge, pedagogical content knowledge, curriculum knowledge, and knowledge of learners and their characteristics.

Considering L2 teachers' knowledge base reviewed above, what is basically required of L2 teachers is the theoretical knowledge and practical skills of language teaching and learning, that is, knowing what to teach, and how to teach it effectively in classrooms. In other words, both content knowledge and pedagogical content knowledge are more central to L2 teachers' knowledge base that they need to acquire and develop to be effective teachers.

2.2. ESL/EFL Teachers' Knowledge of Pronunciation Teaching

Just as more crucial to L2 teachers' successful teaching are content knowledge and pedagogical content knowledge, so there are at least two important categories of knowledge that L2 teachers need to acquire and develop to be effective teachers of English pronunciation. The first domain is theoretical knowledge of sounds or sound patterns of English and of how sound systems function to express meaning, and the second is practical knowledge of teaching pronunciation in an effective way.

In favor of this view, Rogerson-Revell (2011) indicates that both knowledge of phonetics and phonology and practical skills of teaching sounds and prosodic patterns are required of teachers of English pronunciation. Similarly, Murphy (2017) points out that ESOL teachers should develop two domains of knowledge to teach pronunciation effectively; knowledge about phonology, and procedural and pedagogical knowledge about how to teach pronunciation. Brinton (2022) also emphasizes that effective L2 pronunciation teachers should have a solid grounding in both the sound systems of English and the teaching methods most appropriate for L2 learners. More clearly, Brinton, Burri, and Baker (2022) note that effective pronunciation teaching requires a combination of knowledge of the English sound system and practical knowledge of how to teach pronunciation.

Thus, both content knowledge and pedagogical content knowledge are required to be well-prepared L2 teachers of teaching pronunciation. Basically, they must possess sufficient knowledge of "the English sound system and a principled methodology for teaching it effectively" (Celce-Murcia, Brinton, & Goodwin, 2010, p. 43).

2.3. Teachers' Knowledge Base for the Present Study

Although L2 pronunciation teachers need to be well aware of content knowledge (CK) and pedagogical content knowledge (PCK), those two domains of knowledge alone are not sufficient for today's primary teachers of English pronunciation working in the digital information and technology age. With the rapid advancement in digital and artificial intelligence education, primary teachers in Korea are asked to acquire knowledge necessary to adapt to the new information technology education environment. In other words, Korean primary teachers are required to learn and develop their knowledge of introducing new digital technologies in primary classrooms.

This type of teacher knowledge is technological pedagogical content knowledge (TPACK) proposed by Mishra and Koehler (2006), an extension of Shulman's (1986, 1987) pedagogical content knowledge by adding technology knowledge. While studies have uncovered the TPACK constructs and teachers' integration of technology into classrooms including their perceptions of TPACK along with factors affecting their classroom practices,

such as gender, age, teaching experience, etc. (Huang, Qi, & Xie, 2022; Ji & Shin, 2020; Kim, 2022; Koh & Chai, 2011), they have not paid attention to TPACK as one essential knowledge of pronunciation instruction in Korean EFL contexts. Therefore, the present study adds this dimension of knowledge to what primary teachers need to know to teach English pronunciation effectively. In short, three categories of knowledge, CK, PCK, and TPACK constitute core primary teachers' knowledge base for effective English pronunciation teaching in this research.

2.4. Previous Studies on Teachers' Knowledge About Pronunciation Instruction

Despite a growing interest in ESL/EFL pronunciation topics, such as the relationship between pronunciation instruction and learners' phonological improvements (Couper, 2006; Saito, 2007), research in teachers' knowledge about pronunciation teaching has yet been limited. Baker and Murphy (2011) provided a comprehensive literature review of L2 teachers' knowledge base of pronunciation teaching. They pointed out the necessity of classroom-based studies of ESL/EFL teachers' cognition in relation to teachers' actual pronunciation teaching practices in order to have a better and deeper understanding of their knowledge underpinning their instructional practices, outlining some topics in L2 teacher cognition and pronunciation instruction.

Baker (2014), who conducted the classroom-based investigation into 5 university instructors' knowledge of L2 pronunciation techniques, reported that they mainly used the controlled pronunciation activities in the class than guided or free techniques. She also found that all five teachers held beliefs about the importance of listening perception for producing comprehensible speech, the usefulness of kinesthetic/tactile practice to enhance learner comprehensibility, and the tedious pronunciation work.

In the study of student teachers' cognition, Burri (2015) compared 10 non-native and 5 native student teachers' cognition development during the postgraduate pronunciation course, and concluded that the course greatly affected changes in their cognition. It was found that their cognition shifted from teaching segmentals to a more balanced approach to pronunciation instruction, considering suprasegmentals as important features of teaching pronunciation. Student teachers' own pronunciation had a powerful effect on the development of non-native student teachers' knowledge, and native student teachers' knowledge of pronunciation instruction was enhanced with the help of non-native students.

Another major study of teacher cognition in pronunciation teaching was carried out by Couper (2017). This study showed that English teachers in New Zealand had a lack of training and knowledge of phonetics and phonology, especially in the areas of stress and intonation, which led to a lack of confidence in what and how to teach pronunciation. Their

goals for teaching pronunciation varied from intelligibility, accuracy, clarity, and to fluency, which were often determined by the curriculum, or course books.

An interest in the impact of graduate student teachers' training on teacher cognition regarding pronunciation instruction was also shown by Kochem (2022). The researcher indicated that controlled activities were the majority of student teachers' techniques, followed by guided and free activities, although they recognized that the use of communicative pronunciation teaching framework was prominent to develop their cognition and their teaching practices.

Most recently, Jarosz (2023) examined three EFL teachers' beliefs about pronunciation instruction affecting their classroom practices. They all agreed that pronunciation is important in speaking English and that the teaching of pronunciation should be integrated into general English class. In addition, they thought that the best way to learn pronunciation is a lot of practice, a lot of listening and exposure to the language. And they were also shown to prefer the repetition model to correct students' pronunciation mistakes. The study suggested that teacher training programs should be offered to teachers to get more knowledge about English phonetics, and pronunciation teaching methodology, along with access to additional reliable teaching resources.

3. METHODOLOGY

3.1. Participants

Forty-seven Korean primary teachers participated in this study. They include 11 male teachers and 36 female teachers from primary schools in two cities in J Province, Korea. They had a range of teaching experience. Nine teachers had less than 4 years' experience, six had 4-8 years of experience, six had 8-12 years of experience, and twenty-six had over 12 years of teaching experience.

Among them, five primary teachers were chosen as interviewees of qualitative research, in consideration of their age group and teaching experience. Table 1 shows their demographic information.

TABLE 1
Participants' Demographic Information

Teacher	Age	Teaching Experience	Degree Earned	Teacher Training
A	44	17	BA (secondary English Edu.) MA (English Edu.)	Over 1,500 hrs.

B	39	15	BA (primary English Edu.) MA(Counseling) PhD Candidate (primary English Edu.)	About 500 hrs.
C	29	6	BA (primary Ethics Edu.) MA (primary English Edu.)	None
D	52	26	BA (primary Physical Edu.) MA (primary English Edu.)	About 1000 hrs.
E	27	4 months	BA (primary English Edu.) MA student (primary English Edu.)	None

Teacher A, 44 years old, had a BA in secondary English education, an overseas master's degree in English education. She had 17 years of teaching experience, including over 1500-hours-online and offline teacher training experiences at home and abroad. Teacher B, 39 years old, had a BA in primary education, a masters' degree in counseling, and PhD candidate in primary English education. She had 15 years' teaching experience. She has joined several English teacher training programs including 6 month-course for about 500 hours. Twenty-nine years old, Teacher C had a BA in primary Ethics, and a masters' degree in primary English education. She has been teaching primary English for 6 years, but has not participated in any teacher education program. Fifty-two-years old, Teacher D had a BA in primary Physical education, and a master's degree in primary English education. She was a teacher with 26 years of teaching experience and about 1,000 hours of teacher training program. A novice Teacher E, 27 years old, had 4 month-teaching experience. After graduating from the primary English education department, she was taking a master's course in primary English education.

3.2. Data Collection

To collect the data, this study used an online questionnaire and face-to-face interviews. The questionnaire was composed of 25 items about teacher knowledge (10 CK, 10 PCK, and 5 TPACK), to measure participants' knowledge about pronunciation instruction (see Appendix A). The questionnaire was carefully designed to meet the objectives of this research, based on the classification of teachers' knowledge and the statements of their beliefs about pronunciation instruction, and the TPACK framework presented in other studies (Baker, 2014; Jarosz, 2023; Koh & Chai, 2011; Murphy, 2017). After creating the questionnaire in the NAVER forms, the researcher got the link and sent it to primary teachers so that they could respond to it quickly.

In order to identify if the questionnaire items of teachers' knowledge are correlated to each other, the reliability analysis was carried out. The Cronbach's alpha coefficient for the

25 items was 0.954, which was "very highly reliable" (Cohen, Manion, & Morrison, 2011, p. 640). Thus, the questionnaire items had a very high level of internal consistency. Next, exploratory factor analysis was performed to identify the validity of constructs of teachers' knowledge. The result of the Kaiser-Meyer-Olkin (KMO) and the Bartlette test showed that the KMO value was .839, which met the requirement of the accepted value greater than 0.5. It means that the sampling is adequate for analysis. The p-value of the Bartlett's test of sphericity (*approx. chi-square*=946.367, *df*=300) was 0.000, which was below the accepted significance level ($p < 0.05$). It tells that the correlations are significant among the items, i.e., the adequacy of the data for analysis. Each of the communality values of the questionnaire items for this study was above 0.5, satisfying the requirement of better measurement for analysis (> 0.5), by revealing values ranging from .645 to .840.

To examine teacher's knowledge and its embodiment in classroom teaching practices, semi-structured interviews were carried with 5 participants (see Appendix B). The interviews with each participant were conducted for about 50 minutes.

3.3. Data Analysis

The questionnaire data were analyzed using SPSS (29 version) program. Through descriptive statistics, mean and standard deviation between male and female groups were checked along with the mean and deviation among four groups of teaching experience. To know a statistically significant difference in teacher knowledge between males and females, the t-test was conducted. One-way ANOVA was also carried to identify a significant difference in teacher knowledge by teaching experience. The mean scores for 25 knowledge items on the 5-point Likert scale were classified into 4 levels; *good* (mean value, 4.01-5.00), *above average* (3.01-4.00), *below average* (2.01-3.00), and *poor* (1.01-2.00), based on the mean score interpretation by Nunnally and Bernstein (1994).

The interview data were transcribed and analyzed qualitatively according to content analysis (Bengtsson, 2016). Reading through the transcribed data, the researcher created codes, organized them into categories and identified themes and sub-themes emerged in the data according to the qualitative coding framework presented in Appendix C. After understanding how themes were related one another, generalizations were made in relation to research questions.

4. RESULTS AND DISCUSSION

4.1. Teachers' Knowledge About Pronunciation Instruction

4.1.1. Overall teachers' CK, PCK, and TPACK

First, the mean scores and standard deviations of the participants' content knowledge (Item 1-10) are reported in the following table.

TABLE 2
Teachers' Content Knowledge

Item	CK	*M*	*SD*	Level of Interpretation
3	Sound-spelling relationship	4.32	.837	Good
10	Discourse meaning	4.28	.902	Good
1	Description of consonants & vowels	4.15	.834	Good
4	Phonetic modifications	4.00	.860	Above average
9	Intonation	3.74	.846	Above average
6	Content & function words	3.72	1.394	Above average
5	Word stress	3.64	.860	Above average
8	Thought groups	3.64	1.187	Above average
7	Rhythmic patterns	3.62	1.261	Above average
2	Identification of phonemes	2.98	1.260	Below average
Total	1~10	3.81	1.041	Above average

As shown in Table 2, participants overall showed high mean scores in the items of CK, except one (item 2, M = 2.98*; SD* = 1.260*)*, indicating the mean score range of 3.62-4.32. Out of 10 CK items, three showed higher mean scores; item 3 (M = 4.32*; SD* = .837), item 10 (M = 4.28*; SD* = .902*)*, and item 1 (M = 4.15*; SD* = .834). This result means that teachers had a good knowledge of the relationship between sounds and letters, the meaning of intonation in discourse, and the description of consonants and vowels.

The lowest mean score among the 10 sub-domains of CK was item 2 (M = 2.98; SD = 1.260), which showed a below average knowledge of identifying phonemes, complying with the interpretation of the mean score in this present study. The other six items (4, 9, 6, 5, 8, 7) had the mean scores which fell between 3.62-4.00. From this result, teachers were seen to have an above average knowledge of such six items of CK.

Next, table 3 shows the analysis of the participants' knowledge of how to teach pronunciation. Each mean score and standard deviation of 10 PCK items are presented.

TABLE 3
Teachers' Pedagogical Content Knowledge

Item	PCK	*M*	*SD*	Level of Interpretation
16	Non-verbal activities	3.94	.965	Above average
14	Rhymes, poems, chants	3.77	1.088	Above average

15	Role play	3.77	1.088	Above average
19	Intonation contours	3.57	1.118	Above average
20	Feedback	3.57	.927	Above average
17	Planning for pronunciation lesson	3.45	1.017	Above average
18	Stressing focus words	3.45	1.138	Above average
12	Minimal pair drill	3.34	1.128	Above average
13	Meaningful practice	3.00	1.180	Below average
11	Listen & repeat	2.96	1.160	Below average
Total	11~20	3.48	1.081	Above average

Overall, the participants indicated high mean scores in the PCK items ($M = 3.48$; $SD = 1.081$) except one item 11 ($M = 2.96$; $SD = 1.160$) with showing mean scores 3.00-3.94. Among 10 PCK items, the participants reported higher mean scores in 5 items (16, 14, 15, 19, 20). Four items (17, 18, 12, 13) of PCK showed slightly lower mean scores than the five items. These findings imply that the knowledge of primary teachers was above average in the use of non-verbal activities, rhymes, songs, chants, role play, intonation contours, feedback, planning for pronunciation lesson, stressing focus words as well as minimal pair drill. The item 11, listen and repeat technique had the lowest mean score ($M = 2.96$, $SD = 1.160$), which meant that primary teachers had a below knowledge of listening to words or sentences and repeating them. This shows that most of the primary teachers do not know well how to explicitly teach pronunciation using the listen and repeat technique, even though they are familiar with the technique.

This time, let's look at the mean scores and standard deviations of the participants' TPACK presented in the table below.

TABLE 4
Teachers' Technological Pedagogical Content Knowledge

Item	TPACK	M	SD	Level of Interpretation
23	Digital English textbooks	3.96	.932	Above average
24	Pronunciation software programs	3.49	1.140	Above average
22	Choice of available technology	3.34	1.006	Above average
21	Integrating technology in CK & PCK	3.28	.994	Above average
25	New technology (AI Pengtalk, or Metaverse)	2.89	1.202	Below average
Total	21~25	3.39	1.055	Above average

A total mean score of teachers' TPACK was 3.39, which indicates slightly higher than average score 3.00. Out of 5 items of TPACK, four items excluding one (Item 25, $M = 2.89$; $SD = 1.202$), revealed mean scores from 3.28 to 3.96. In this sense, primary teachers had an above average knowledge of using digital English textbooks, pronunciation software

programs, along with good use of technology. However, the participants gained the lowest mean score in the use of new technology. It shows that primary teachers had a limited knowledge of new technology in the digital era, such as an AI Pengtalk or Metaverse.

When comparing with total mean scores of teachers' knowledge, they had a better understanding of CK than PCK and TPACK, and they knew more about PCK than TPACK. Even though these three categories play important roles in teaching pronunciation, it seems desirable that primary teachers know well about the theory of phonetics and phonology before they apply and transform the subject matter knowledge in classroom practices effectively, as Murphy (2017) indicates.

4.1.2. Difference in teachers' knowledge by gender

The mean scores and standard deviations of male and female participants' CK, PCK, and TPACK about pronunciation teaching are reported in Table 5, 6, and 7 respectively.

TABLE 5
Difference in 2 Groups' CK

Gender/Item		1	2	3	4	5	6	7	8	9	10
Male	*M*	4.27	3.45	4.36	4.00	3.73	4.00	3.45	3.55	3.82	4.36
	SD	.647	1.128	.809	.632	.786	1.342	1.293	1.293	.751	.809
Female	*M*	4.11	2.83	4.31	4.00	3.61	3.64	3.67	3.67	3.72	4.25
	SD	.887	1.276	.856	.926	1.103	1.417	1.265	1.171	.882	.937

TABLE 6
Difference in 2 Groups' PCK

Gender/Item		11	12	13	14	15	16	17	18	19	20
Male	*M*	3.27	3.64	3.27	3.82	3.91	3.91	3.55	3.45	3.73	3.55
	SD	1.272	1.206	1.272	.982	1.136	1.300	1.214	1.293	1.104	.934
Female	*M*	2.86	3.25	2.92	3.75	3.72	3.94	3.42	3.44	3.53	3.58
	SD	1.125	1.105	1.156	1.131	1.085	.860	.967	1.107	1.134	.937

TABLE 7
Difference in 2 Groups' TPACK

Gender/Item		21	22	23	24	25
Male	*M*	3.45	3.55	4.00	3.64	3.36
	SD	1.036	.688	1.095	1.027	.809
Female	*M*	3.22	3.28	3.94	3.44	2.75
	SD	.989	1.085	.893	1.182	1.273

Comparing the mean scores of two groups, males' means were higher in 20 items than

those of females. On the other hand, females exhibited higher mean scores in four items (7, 8, 16, 20). They revealed the same mean score in Item 4. Seemingly, it may be that male teachers have a better knowledge about pronunciation instruction than female teachers.

Thus, the t-test needed to be run in order to identify if it was true, or to find a statistically significant difference between two groups. The result of the t-test showed that the probability value of total 25 items of knowledge were greater than 0.05, i.e., $p > 0.05$. That is, no statistically significant difference was found in the male and female teachers' knowledge. Therefore, the gender factor does not affect significantly the primary teachers' knowledge about pronunciation teaching.

4.1.3. Difference in teachers' knowledge by teaching experience

The following SPSS output shows the sum of the means, standard deviations, standard error, etc. for four groups by teaching experience.

TABLE 8
Four Groups' Knowledge Scores (Descriptives)

Teaching experience	N	M	SD	SE	Min	Max
-4 yrs	9	87.44	4.845	4.845	75.00	117.00
4-8 yrs	6	80.50	12.214	12.214	34.00	118.00
8-12 yrs	6	89.33	8.508	8.508	69.00	123.00
12- yrs	26	92.96	3.495	3.495	59.00	125.00
Total	47	89.85	2.813	2.813	34.00	125.00

As shown in Table 8, the mean score of the participants over 12 years of teaching experience was the highest ($M = 92.96$; $SD = 3.495$), followed by that of the participants with 8-12 years of experience ($M = 89.33$; $SD = 8.508$), that of the participants with less than 4 years of experience ($M = 87.44$; $SD = 4.845$), and that of the participants with 4-8 years of experience ($M = 80.50$; $SD = 12.214$). This SPSS output hints at some possibility that there will be a meaningful difference in their knowledge between 4 groups.

In order to examine a statistically significant difference in it, one-way ANOVA was employed. However, the output of one-way ANOVA test indicated that it was not.

TABLE 9
Four Groups' Knowledge Scores (ANOVA)

	Sum of squares	df	Mean square	F	Sig.
Between groups	829.940	3	276.647	.731	.539
Within groups	16278.017	43	378.559		
Total	17107.957	46			

As presented in Table 9, the *p*-value is 0.539, greater than 0.05. This tells that there is not a statistically significant difference between 4 groups with different teaching experience. To make it clear, the Tukey test was carried out, but no statistically significant difference was also found between four groups. Consequently, the primary teachers' teaching experience does not have a statistically significant impact on their knowledge about pronunciation instruction. This may result from the fact that the number of participants by teaching experience to be compared within the 4 groups is uneven (9 with less than 4 years of experience, 6 with 4-8 years, 6 with 8-12 years, and 26 with over 12 years).

4.2. Manifestation of Teachers' Knowledge in Classroom Practices

4.2.1. Recurring themes from the interview data

The major themes that emerged from all the interviews about the pronunciation instruction were classified into two categories and seven themes with several sub-themes. The following table shows the emerging themes and sub-themes from the interview data.

TABLE 10
Themes and Sub-themes from Interviews

Categories	Themes	Sub-themes
Teachers' classroom practices	Pronunciation goals	Intelligibility, Comprehensibility, Nativeness
	Teaching priorities	Segmentals, Suprasegmentals
	Pronunciation activities	Controlled, Guided, Free practices Preferred techniques, Non-verbal techniques
	Use of technology	AI Pengtalk, Padlet, Google speaker, Google assistant, You tube, Audio/video clips, Internet, PPT,
	Error correction	Explicit correction, Clarification request, Repetition, Note-taking, Meta-linguistic technique
Sources of knowledge	Acquiring & developing knowledge	Curriculum courses, Professional development, Self-reflective practice

4.2.2. Goals of pronunciation instruction and teaching priorities

The first theme emerged from all the interviews was a goal of pronunciation teaching. All five participants took the same view, although it appeared differently only in terms of expression. For example, Teacher A mentioned that "it is necessary when teaching English pronunciation, the teacher should help students improve intelligibility. Students are more important to understand speakers of British or American English, Hong Kong English and Filipino English." In favor of this view, Teacher D stated that "primary learners'

pronunciation doesn't need to be native-like but intelligible to the listener in order to understand what the speaker says." Similarly, Teacher E commented that "although we do not have a good pronunciation, we must be able to communicate in using comprehensible English, when we meet foreigners." Thus, she thought her students should use English easily understood by listeners."

Some participants tended to emphasize the pronunciation goal for effective communication. For instance, Teacher B noted the acceptable pronunciation for conveying meaning effectively, saying "when speaking English, it is good enough to understand the speakers' utterance even with foreign accent." Specifically, Teacher C stressed the use of pronunciation understandable for communication, stressing that "the appropriate goal of learners' English pronunciation should be the level where speakers and listeners can mutually communicate." In other words, she objected nativeness as a pronunciation goal, adding that "it is almost impossible to achieve native-like pronunciation." Such results are in line with other research (Brinton, 2018; Derwing & Munro, 2015; Murphy, 2017; Pennington, 2021), which argued the goal of pronunciation teaching was to promote L2 learners' comfortable intelligibility, not to emulate native speaker speech as accurate as possible.

About what features are more important to teach, four participants were found to give pedagogical priorities to teach suprasegmentals, while one to segmentals. For example, Teacher A indicated the primacy of teaching segmentals over suprasegmentals, focusing on accurate production of individual sounds. She expressed:

> "I think it beneficial for EFL young learners to be well trained to clearly produce individual sounds of English, on which understanding of suprasegmentals is built. Teaching individual sounds to young students is very useful for raising phonemic awareness and improving accuracy of pronunciation."

Contrary to her, Teacher B had a different view on giving priorities to suprasegmental aspects in terms of effective oral communication. She made a point:

> "I emphasize suprasegmental features in primary English class, because I think stress, rhythm, intonation greatly affect oral communication than segmentals. If students' errors of those features are fossilized, they can't convey their intended meaning effectively to the listeners."

Teacher C also highlighted the importance of suprasegmentals that affect the meaning to be delivered. She noted:

> *"I prioritize suprasegmentals when teaching English pronunciation to primary students, because they play a more important role in conveying or changing the meaning in spoken language."*

Similarly, Teacher D thought it more important to teach stress and intonation than individual sounds in the role play technique. She stated:

> *"I focus on teaching stress and intonation more than consonants and vowels, since spending too much time on practicing segmentals is boring. By learning stress and intonation through role play naturally, EFL students may feel interested in learning pronunciation and more motivated to speak English."*

Lastly, Teacher E emphasized the teaching of stress and rhythm to make students be aware of a stress-timed English language. She mentioned:

> *"It is more effective to put an emphasis on teaching stress and rhythm so that young learners can understand the characteristics of English as a stress-timed language. If they became familiar with hearing spoken English with a natural rhythm, they can easily improve their pronunciation abilities."*

4.2.3. Pronunciation activities

All of the participants performed a range of pronunciation classroom activities involving controlled and free activities. As L2 teachers in other research (Baker, 2014; Kochem, 2022) frequently used controlled activities in pronunciation teaching, the participants in the current study used the listen and repeat technique, or shadowing as controlled activities.

For example, Teacher A asked students to listen to what the speaker said and repeat them. Similarly, Teacher B had students listen to her provided model sentences and repeat them. And Teacher E made students listen to CD-ROMs and repeat after the speakers. Contrary to this traditional teaching technique, Teacher C commented she used shadowing which "makes students listen to a Disney story book, *Frozen* and imitate it." She believed that the technique could make students imitate a native utterance as closely as possible which might lead to their pronunciation improvements. Teacher D also pointed out that her class was often asked to mimic speakers' voices and imitate their gestures, showing them video clips.

Some participants expressed that they used songs (C, D) for teaching word stress, chants (B, D, E) for practicing stress and rhythm, word games (A, D) and sentence-building games (E) for training individual sounds. Those activities fell into the forms of controlled

pronunciation practice.

Most remarkably, all participants preferred role play as free practice to teach pronunciation in classrooms. Among them was Teacher A who put role play into classroom practices very well. She seemed to make a careful preparation for both controlled and free role plays for practicing pronunciation:

> *"Students like role-playing very much, because they are given good opportunities to speak with their friends in class. At first, I try to make them practice sounds in useful key words or expressions. Then, I have them do role play in controlled contexts, using conversation scripts. After that, I let them speak their own sentences as much as possible in English, paying attention to intonation. Lastly, I check what they have done, asking them comprehension questions".*

Teacher B had her students do role play based on the dialog from the textbook. She felt that using the language they had already learned would make role play more interesting to practice pronunciation. She commented:

> *"I have usually students do role play, because it gives them an opportunity to learn English in different situations which increase motivation to speak. After practicing the dialog within the textbook, I let students play a role of two people in the dialog, while pronouncing the target sounds clearly".*

Likewise, Teacher E was concerned with a controlled role play based on the textbook to practice both segmentals and suprasegmentals:

> *"After practicing a dialog between A and B from the textbook, students are asked to make role play scripts with their* friends *and to practice difficult sounds, stress, rhythm and intonation. Practicing the scripted dialog with partners, they learn the natural rhythm of English and intonation patterns."*

Teacher C tried to teach pronunciation effectively, making use of role play, showing children interesting animations which add interest to them. She stated:

> *"Role play is an enjoyable activity in which children imagine themselves as different persons doing something different. Showing them animations and acting out the characters in them, I make students speak English with correct*

> *stress and intonation. While practicing with their partners, they can improve*
> *pronunciation skills naturally."*

Teacher D suggested role play in a conversation about ordering food. While taking the role of different persons, she thought, students could be accustomed to correct and natural pronunciation:

> *"Ordering from a menu in a restaurant can give students a good chance to*
> *practice pronunciation in a fun role play situation. Student A plays a waiter,*
> *and Student B is a customer. They practice the use of appropriate intonation*
> *pattern of the sentence, "May I take your order?" and the underlined sounds,*
> *"I'd like a vegetable pizza."*

As a means of making the students understand the pronunciation of both segmentals and suprasegmentals clearly, all participants stated that they use non-verbal activities in classroom practices. For example, stretching rubber bands for the underlined stressed syllable like the word Missi**ssi**ppi and hand movements for rise and fall of the pitch (Teacher A), a strong hand gesture for the target sound, [tʃ] in 'chair' (Teacher B), arm and hand movements for intonation contours as well as visual clues, such as large/small dots, and upward/downward arrows (Teacher C), raising and lowering hands for stress and intonation (Teacher D), and body movements for chants (Teacher E) were found to use frequently by the participants respectively. These findings confirm the previous work (Baker, 2014) which showed that English teachers used non-verbal activities like kinesthetic and tactile techniques in classroom practices, such as body movements using rubber bands, and clapping on a desk

4.2.4. Use of new technology

All the participants reported using the traditional instructional technology for teaching pronunciation, such as audio/video resources, internet, and other visual aids. However, three participants (A, B, E) integrated a new technology into classroom practice, unlike two participants (C, D) who just mentioned what it was. As an illustration, Teacher A used an AI Pengtalk to make students enhance their pronunciation:

> *"I think the use of AI Pengtalk in English class significantly help students*
> *evaluate their pronunciation from the level of individual words to sentences.*
> *It seems to me that the new technology is an important tool for monitoring*
> *and improving students' own pronunciation."*

In a similar vein, Teacher B was sure of using as a new tool for practicing pronunciation:

> *"I have used an AI Pengtalk as a new tool to practice pronunciation in primary classrooms. I think it is very useful in improving students' pronunciation in that it made them assess the pronunciation of segmentals, stress, rhythm, speech rate, intonation, and gave them useful feedback such as 'excellent', 'good', and 'try harder'."*

Another use of new technology was found in the following Teacher E's quote:

> *"I use a Google assistant to practice pronunciation and speaking skills. When I ask it how to pronounce a word, teacher?", it tells me a correct pronunciation of the word teacher[tíːʧə(r)]. In addition, I can practice speaking skills, talking to an AI conversation partner in the tool."*

However, all participants were found not to use new pronunciation technology, such as Praat, which means a computer software program for speech analysis offering a wide range of analysis for speech signals, including spectrograms, pitch contours, formants and intensity contours, etc.

4.2.5. Error correction

The other theme that the participants mentioned frequently during the interviews was error correction in primary students' pronunciation. Most of the participants liked to provide error feedback indirectly, and in an encouraging way. However, the types of corrective feedback on pronunciation errors used by the participants were different to some degree. Two participants (A, E) provided a little different type of explicit correction which provide correct forms explicitly. For example, Teacher A used the technique focusing on helping her students correct themselves. She made it clear: "I don't correct errors immediately. Instead, I try to help the students correct themselves, while reformulating the correct form. Once a boy student said, "Give me three apples", as "Give me [srɪ əplz]", I said, encouraging him. "Yes, good. Give me [ɵrɪ æplz]," to make him know what he has got wrong for himself."

Similar to this view, Teacher E also used explicit correction, saying "I read all parts of the student's utterance. When a student says, what food[fʊd] do you like? I read again, correcting the error, What food[fuːd] do you like?" Lengthening the word *food,* she had the student listen and repeat it, and finally she praised the student.

Teacher B expressed that she used a clarification request involving the phrase such as "Excuse me," to indicate the student's utterance had some kind of mistake, followed by a

repetition: "Moving around the class during the pair work, I find one student say, "Where are you from[prɑm]?" I say in an encouraging way, "Pardon?" The student answers again, "Where are you from[prɑm]?" Then, I say the correct form, *from*[frɑm], while stressing the prominent word, *where.*

The other type of corrective feedback was a combination of note-taking and a meta-linguistic technique employed by Teacher D. She revealed that she just noted an error down and dealt with it later, as seen in the quote, "When one student mispronounces the word *this* in the utterance What's this? as [dis], I notice and write down the error first. And then I correct it, encouraging the student." She went on saying that "I explain how to make the sound [ð] to the whole class, pointing out the student produced an alveolar sound instead of an interdental fricative, while stressing the focus word *this*."

Finally, Teacher C answered that she usually used a repetition technique. She explained it clearly, taking an example of the word *salmon*: "When a student pronounces *salmon* as [sælmən], I repeat it like *salmon*[sælmən]? to highlight the error. And then I correct it clearly, like [sæmən], stressing the first syllable of the word, [sæ]."

4.2.6. Acquiring and developing knowledge

The last emerging theme was concerned with from where they got knowledge related to pronunciation teaching. As an important source of knowledge, Teacher A indicated the undergraduate courses in phonetics and phonology, by emphasizing that "the knowledge of what I teach and how I teach is greatly affected by phonetics and phonology courses that I have taken in college." It was also true she got knowledge from other sources such as graduate pronunciation pedagogy and teacher training courses, but college phonetics and phonology courses were the most influential. To make it sure, she said that "what she has learned from graduate and teacher training programs is within reach of the theoretical and practical pronunciation knowledge of college courses."

The other four participants (B, C, D, E) attributed their knowledge about pronunciation instruction to graduate courses, like English pronunciation instruction, and modern English phonetics and phonology, etc. For example, Teacher B mentioned that "I had lack of knowledge in pronunciation teaching before going to graduate school. While I was taking modern English phonetics and phonology, I learned practical methods of teaching pronunciation in classrooms." Teacher C also reported the same view as in the following. "The course of English phonetics and phonology that I took in graduate school helped me learn how to teach segmentals and suprasegmentals." It was also evident that Teacher D got her knowledge about pronunciation while in graduate school. She indicated that "I learned subject matter knowledge of phonetics and practical knowledge of teaching pronunciation during the graduate course." At that time, she had good chances to read books and journals

about topics in pronunciation pedagogy, which equipped her with firm foundations of teaching pronunciation in primary schools. The impact of graduate pronunciation courses on acquiring knowledge was also true of Teacher E, seen from her following comments. "While taking courses in English pronunciation instruction and English phonetics and phonology, I got very useful knowledge and information about pronunciation teaching, such as conceptual knowledge of phonetics and phonology and procedural knowledge of teaching pronunciation in classrooms."

This result supports the findings presented in previous studies (Bai & Yuan, 2018; Baker, 2011, 2014; Burri, 2015; Levis & Kochem, 2023), which argued that the undergraduate phonetics, or graduate phonology and pronunciation pedagogy courses or teacher pronunciation education at both pre-and in-service stages had a great impact on teachers' having a better understanding of what to teach and how to teach pronunciation.

Most of the participants seemed to develop their knowledge about pronunciation teaching based on reflective teaching, in which they reflect on their philosophy, theories and principles of pronunciation instruction that relate to their classroom practices (Farrell & Macapinlac, 2021). They tried to improve their pronunciation pedagogy through continuous reflection on the last lesson, reflection during the lesson, and reflection for the next lesson. Teacher A strove to evaluate her lesson after class, focusing on students' understanding of the lesson, their motivation and involvement in pronunciation activities for the next class. Teacher B and Teacher D made an effort to reflect on their knowledge about both theory and practices in pronunciation instruction and develop them, utilizing a variety of resources on You tube or Google websites.

Although the quantitative analysis of the questionnaire data revealed that the participants had an above average knowledge of the PCK and TPACK domains, the qualitative analysis of the interview data indicated that the interviewees had a good knowledge of the two domains and put them into classroom practices. It suggests that primary teachers are able to develop their knowledge of English pronunciation instruction and to demonstrate it in class in order to be more effective teachers of pronunciation in their professional life.

4.3. Discussion

It was found that the participants in the questionnaire were appropriately equipped with the three types of knowledge about pronunciation instruction, CK, PCK, and TPACK. Out of 25 knowledge items, they exhibited reaching the level of knowledge counted as *good* (3 items), *above average* (18 items) and *below average* (4 items). Thus, those participants in this study were likely to be prospective and effective teachers who had adequate theoretical and practical knowledge about pronunciation instruction as well as enough confidence in teaching pronunciation, in contrast to teachers in other studies (Bai & Yuan, 2018; Couper,

2017, 2021) indicating that a lack of content knowledge of phonetics and phonology and a lack of pedagogical knowledge led to low confidence in teaching pronunciation and neglect of pronunciation teaching.

Furthermore, all interview participants set their pronunciation goal as mutual intelligibility for effective communication, not native-like correctness in that the native speaker norms could not be attainable. Although not a few studies still adhere to nativeness as a pronunciation goal and some learners may want to attain native-like pronunciation, it is reasonable that primary teachers in Korean EFL contexts set comfortable intelligibility as a pronunciation instruction goal, because it is more important to effectively convey meaning in communication than to correctly produce sounds like a native speaker. Especially, in post-EFL contexts where English is used as a lingua franca (Jenkins, 2006; Mckay, 2002) to communicate or a language of inter-national and intra-national interactions (Sifakis, 2014), it will be more advantageous for students to learn pronunciation for effective communication, i.e., speech comfortable for listeners to understand (Baker, 2014; Couper, 2017), or "accented yet easily understood speech" (Brinton, 2018, p. 287).

All of the participants, excluding one, felt that they needed to prioritize suprasegmentals over segmentals, since suprasegmental features could have a powerful influence on mutual communication. Their belief about pedagogical priorities focusing on stress, rhythm and intonation may greatly help students promote their intelligibility and fluency for communicative purposes in classroom practices. However, accurate production of individual sounds, especially in the stressed syllables can also contribute most to intelligibility (Richards, 2015). In addition, it is more significant that young learners of English should understand where sounds are made and how they are articulated correctly. Therefore, it is recommended that primary teachers in Korea take a balanced approach to teaching both segmentals and suprasegmentals appropriately, depending on the students' levels, needs and interests.

The participants tended to consistently reflect what they declared in their interviews in classroom practices. For example, Teacher A who expressed a strong belief about correct production of segmental sounds emphasized teaching consonant and vowels accurately, using a listen and repeat technique and role play. The other four participants reporting prioritizing suprasegmentals in pronunciation teaching had a tendency to enrich teaching techniques and corrective feedback for practicing stress, rhythm and intonation in their practices, ranging from listen and imitate techniques, shadowing, chants, songs, games to role plays. It should be specifically noted that all five participants felt role plays were interest-provoking and useful for practicing pronunciation for primary school students, in that they could give the students a suitable opportunity to learn English and at the same time to train pronunciation in real life situations. This demonstrates that they manifested appropriately what they acquired in communicative language teaching into what they did in

the classrooms to teach pronunciation effectively.

The other point to make here is about the participants' adaption of new technology to teach pronunciation in primary schools. The participants in the questionnaire showed relatively lower mean scores in TPACK than those in CK and PCK in the statistical analysis reported in 4.1. Among the five interview participants, three teachers (A, B, E) indicated that they could use the new pronunciation technology like an AI Pengtalk and Google Assistant as a good tool for monitoring their pronunciation developments, but two teachers (C, D) did not make use of it. Besides, all of them did not know how to use such a visual pronunciation feedback tool as Praat. In this sense, primary teachers must be able to analyze and understand the features of new pronunciation technology, and to employ the knowledge acquired from it into classroom practices.

Finally, it should be pointed out that this study did not have so many participants and that only female teachers took part in the interviews. If a large number of teachers were the questionnaire respondents and male teachers participated in the interviews, more different study results would be found in their knowledge base of pronunciation instruction.

5. CONCLUSION AND IMPLICATIONS

This study explored the knowledge about pronunciation instruction of primary teachers in Korean EFL contexts and its embodiment into classroom practices effectively. The analysis of the questionnaire data showed that they had a relevant knowledge base of three types of knowledge, CK, PCK, and TPACK needed to teach English pronunciation in primary schools, but no statistically significant difference was found in teachers' knowledge between male and female teachers. And also, there was no statistically significant difference in teachers' knowledge between the four different teaching experience groups.

The primary teachers who were interviewed for this study well applied knowledge from undergraduate or graduate phonetics and phonology courses including pronunciation instruction courses in teaching English pronunciation. Setting the goal of pronunciation instruction as comfortable intelligibility for effective communication, and prioritizing suprasegmentals over segmentals, most of the primary teachers could consistently manifest their theoretical and practical knowledge about pronunciation pedagogy in classroom practices, such as verbal and non-verbal pronunciation activities, error feedback provision, and the use of technology. They used a wide range of classroom activities from controlled to free practice including the listen and repeat technique, the listen and imitate technique, songs, chants, games as well as role play, even though they did not introduce the guided practice into classrooms.

Of special interest in this research was that all the participants in the interviews thought it

effective to make the students do role play to learn pronunciation. This was a good case of reflecting knowledge from the communicative language teaching in ESL/EFL fields in teaching pronunciation to primary school students. In addition to this finding, all five teachers made use of their own corrective feedback, such as explicit correction, clarification request, note-taking and meta-linguistic feedback, and repetition. Furthermore, most of them tried to adapt such a new technology as an AI Pengtalk or Google speaker to teach pronunciation in the digital era, although they did not integrate a visual pronunciation tool like Praat. Especially, primary teachers showed the possibility of being confident in implementing pronunciation classroom practices, supported by the relevant knowledge base of CK, PCK, and TPACK.

The findings have implications for acquiring and developing the teacher's knowledge about pronunciation instruction. Considering all the interview participants' views on sources of the teacher's knowledge as college or graduate course lectures like phonetics and phonology including pronunciation pedagogy courses, primary teachers should be given opportunities to acquire theoretical knowledge about phonetics and phonology as well as practical skills of teaching pronunciation from the pre-service stage. Thus, pre-service teachers need to be offered extensive CK, PCK, and TPACK about pronunciation instruction in the pronunciation course. It is also important that teachers' colleges provide pre-service teachers with more knowledge about not only articulatory phonetics but also acoustic and auditory phonetics, in which they can gain in-depth knowledge of perception and production of speech sounds required for explicit pronunciation instruction. In addition, it will be more meaningful to give in-service teachers ongoing professional development programs focused on what they need to know, how they should teach, and how they learn to teach (Johnson, 2009), where sufficient disciplinary knowledge about phonetics and phonology, and adequate procedural knowledge about how to teach pronunciation, are introduced and implemented in classroom practices effectively. In particular, as primary teachers for this study revealed a little shortage of TPACK, they should be given teacher training opportunities to acquire and develop more knowledge of new technology including "useful user-friendly software" (Derwing, 2010, p. 30) suitable for pronunciation instruction of young learners to increase their motivation and interests.

This study also suggests that primary teachers should know well about both theory and practice in pronunciation teaching. In other words, they should not place too emphasis on either of the theoretical and practical knowledge about pronunciation teaching, but reconcile both theory and practice (Brinton, 2018), while they are translating CK, PCK, and TPACK into classroom practices. They need to try to strike a balance between "theorizing from practice" (Richards, 2015, p. 125) and practicing from theory in teaching English pronunciation, by continuously reflecting on their theoretical knowledge about phonetics and phonology, and practical skills of teaching pronunciation to be effectively demonstrated

in classroom practices.

Despite the important findings and pedagogical implications, there are some limitations to be acknowledged in this research. These include the small number of male participants (11 teachers), compared with that of female participants (36 teachers). In addition, there can be further categories of primary teachers' knowledge to be addressed for effective pronunciation teaching, such as the knowledge of the learners, the knowledge of the curriculum, and the knowledge of contexts. Further research on the knowledge base of the larger samples of primary teachers should be carried out, focusing on what they need to know to teach pronunciation related to learners' characteristics, curriculum factors, and other educational contexts that can affect their pronunciation pedagogy and classroom practices.

Applicable level: Elementary

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APPENDIX A

Questionnaire

This questionnaire is to identify the extent to which you have knowledge about English pronunciation teaching as a primary teacher. Please read each statement and circle the number that best indicates your view on pronunciation teaching (1=strongly disagree, 2=disagree, 3=neither agree nor disagree, 4=agree, 5=strongly agree).

No.	Statements	1	2	3	4	5
1	I know the ways of describing the consonants and vowels in terms of their classification parameters.					
2	I know the basic procedures of identifying phonemes by assigning different allophones to separate phonemes.					
3	I know the correspondences between the sounds and spellings.					
4	I know the processes of modification of sounds in connected speech. i.e., assimilation, palatalization, deletion, linking, etc.					
5	I know simple word stress and complex word stress.					
6	I know content words are usually stressed and function words are usually unstressed.					
7	I know that stressed syllables occur at regular intervals in phrases and sentences, and unstressed syllables are reduced or made shorter.					
8	I know using pauses to divide utterances into thought groups.					
9	I know what intonation is, what form it takes, and how it functions.					

10	I know different patterns of intonation in the same sentence can convey differences in meaning.					
11	I know the techniques for teaching segmental sounds and suprasegmental features explicitly by listening to words or sentences, and repeating them.					
12	I know how to teach learners the accurate articulation of target sounds, using the minimal-pair drills in a word or sentence level.					
13	I know the techniques for teaching segmental sounds and suprasegmental features in meaningful contexts such as question-answer exercises or short dialogs.					
14	I know how to help learners understand the rhythmic patterns of English by using nursery rhymes, poems, limericks, and chants.					
15	I know how to teach learners the accurate production of target sounds, using a communicative practice like role play, and how to help them speak sentences with correct stress and intonation patterns of English.					
16	I know the techniques for teaching stress and intonation by using a variety of non-verbal activities (gestures, clapping, tapping, etc.).					
17	I know planning lessons for teaching pronunciation in a sequence of presentation, practice, and production that involve activities suitable for learners' needs, levels, and interests.					
18	I know how to make learners identify the focus words in a sentence, and practice the stressed syllable of them in each thought group.					
19	I know how to teach intonation patterns that correspond to different types of sentences.					
20	I know how to provide learners with feedback on their pronunciation effectively, or to correct their pronunciation when they make errors.					
21	I can teach pronunciation by appropriately integrating the content knowledge of English phonetics and phonology, practical knowledge of pronunciation teaching, and the knowledge of technology use.					
22	I can choose technologies required for teaching pronunciation effectively by using the content knowledge of English phonetics and phonology in English classrooms.					
23	I can use a variety of teaching and learning materials in digital primary English textbooks for learners to practice pronunciation.					
24	I can use several internet programs or online websites such as automatic speech recognition and Praat to diagnose or test the pronunciation of primary English learners.					
25	I can use new technologies like Metaverse or AI-based tools to make learners practice pronunciation effectively.					

APPENDIX B

Questions for Semi-Structured Interviews

No.	Questions
1	What level of proficiency do you expect your learners to reach when teaching English pronunciation?
2	Which aspects of pronunciation do you focus on when teaching English pronunciation?
3	What types of pronunciation activities do you usually use to teach English pronunciation? Please provide examples of controlled practice, guided practice, and free practice.

4	What technique do you employ that is the most helpful for teaching English pronunciation?
5	What tactile and kinesthetic activities are beneficial to pronunciation improvement of your learners?
6	What kinds of technology can you make use to teach pronunciation in your English class? Explain a range of traditional and new technology available for your pronunciation teaching?
7	What technology do you use to diagnose, assess, and monitor your learners' pronunciation?
8	How do you correct your learners' pronunciation errors?
9	What have you learned your knowledge about pronunciation teaching through? Pre-service training? Graduate pronunciation courses? In-service professional development programs, or others?
10	What efforts do you make in order to develop knowledge required to teach English pronunciation effectively?

APPENDIX C
Qualitative Coding Framework