

Identification of Content Knowledge Required for Chinese Pre-service EFL Teachers to Teach Phonics

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Abstract

Empirical studies have shown that pre-service EFL teachers were not well prepared to teach phonics because they lacked a phonics instructional guide. To develop the guide, the required knowledge should include reference to a needs assessment at the initial stage of instructional design. This study aimed to identify the required knowledge with which pre-service EFL teachers can teach phonics. A survey was issued to 146 school EFL teachers who were appointed as practicum supervisors from five full-fledged schools, a focus group discussion was held among 7 EFL group directors, and a focus group discussion was conducted among 5 teacher educators. The results revealed that 7 knowledge dimensions generalised from the literature were consolidated as required knowledge, including i) phonics-related knowledge; ii) decoding rules; iii) phonics instruction approaches; iv) sight words instruction; v) sound system knowledge; vi) phonemic awareness; and vii) rule-maintenance approach. Three new findings also emerged. First, a knowledge discrepancy was identified in understanding the National English Curriculum. Second, further investigation is needed into the Curriculum Design and Study of the Curriculum and Textbooks courses in teacher preparation program. The third is the suggestion to include curriculum design and lesson planning within the knowledge required by EFL group directors, through which enlightened educators include lesson plans in the phonics instruction approaches section in the guide. Most importantly, the identified required knowledge would provide the prerequisites for investigating pre-service EFL teachers' present knowledge and their desired changes needed to develop a guide that prepares them to teach phonics.

Keywords: EFL context, instructional design, knowledge base, needs assessment, phonics instruction, subject matter content knowledge

1. Introduction

Phonics, in a narrow sense, is defined as the letter-sound relationship in the English language (Bear et al., 2020). Broadly, it is regarded as an early English language reading method that fosters language learners' ability to identify and manipulate the phonemes used in oral language so they can learn how phonemes and graphemes correspond (Gopal & Singh, 2020; Papp, 2020). Phonics instruction, as a teaching activity, aims to teach language learners about the phoneme-grapheme correspondence (Gopal & Singh, 2020). It benefits all language learners, including EFL learners who are also struggling readers in English, in terms of decoding, reading accuracy, reading fluency, reading comprehension and spelling (International Literacy Association [ILA], 2019; Papp, 2020). In mainland China, teaching phonics was suggested by the National English Curriculum for Compulsory Education in 2011 (Ministry of Education, 2011), a proposal that was further specified and emphasised in the newly released National English Curriculum for Compulsory Education in 2022 (Ministry of Education, 2022). To note that, in China, compulsory education includes Grade 1-Grade 6 in primary schools and Grade 7-Grade 9 in lower secondary schools. Some full-fledged schools include Grade 1 to Grade 9. In the context of this study, specifically, schools are referred to as the full-fledged schools that offer both the primary and lower secondary education within the same premise. According to a specific section in this new curriculum, the ultimate purpose of phonics instruction is to enable EFL learners to achieve word recognition automaticity by the end of the Ninth Grade at the latest. Ideally, EFL learners should at least start to learn phonics decoding rules from Grade Three onwards and vocalise unknown words via the acquired phonics decoding rules. In other words, phonics instruction is practically mandatory in assisting EFL learners to realise reading automaticity at word level rather than text level (Nasir et al., 2019). Moreover, to maximise the teaching quality, the National English Curriculum (Ministry of Education, 2011, 2022) emphasised the need for professional training to update the teachers' knowledge base. This should include both subject matter content knowledge and pedagogical content knowledge because, from the behaviourist perspective, teachers are responsible for manipulating the knowledge input in a specific learning environment when endeavouring to alter the learners' learning outcomes (Robinson, 2018). Blevins (2017), ILA (2019) and Papp (2020) noted the importance of a teacher's knowledge base, stating that subject matter content knowledge is especially essential as it affects a teacher's pedagogical decisions and logically determines the teaching efficacy. To implement phonics effectively and assist EFL learners to recognise unknown words rapidly to achieve word-level reading fluency, in-service and pre-service EFL

teachers must undertake professional phonics training.

Between 2011 and 2022, numerous empirical studies were conducted on phonics. Most of these focused on the effectiveness of phonics instruction among elementary- to high-school age EFL learners. However, several studies have indicated in-service EFL teachers' inadequate knowledge of phonics instruction due to the absence of a phonics instructional guide (Long, 2019; Zhao, 2019; Zhong, 2020; Zhong & Kang, 2021). In these studies, novice EFL teachers also attributed their incompetence in teaching phonics to the absence of a phonics instructional guide, which was not utilised in their teacher preparation program. More specifically, they learned the International Phonetic Alphabet [IPA] in their phonology class, but mainly to improve their own English speaking skills rather than prepare them to teach phonics (Zhao et al., 2015; Zhao, 2019). Hence, in response to the aim of the National English Curriculum to better implement phonics instruction in mainland China, a phonics instructional guide needs to be developed and, furthermore, adopted in teacher preparation programs to prepare pre-service EFL teachers for phonics instruction. Such a guide would also hopefully be adapted for professional continuing education for in-service EFL teachers.

To design such an instructional guide, a needs assessment is crucial to ensure the quality of the instructional design, as suggested by Morrison et al. (2019). Furthermore, it is essential to identify the specific subject matter content knowledge required for completing the target teaching assignments (Macalister & Nation, 2020). Such a required knowledge base, as advised by Macalister and Nation (2020), can be generalised from previous literature or the target situation. Through target situation analysis, the required knowledge base can be identified first. Then, the target groups' present knowledge and the desired changes in the needs assessment framework developed by Macalister and Nation (2020) may be identified sequentially to assist in the formulation of the goals and objectives of the instructional design (Branch, 2018). In other words, identifying the required knowledge base via target situation analysis is the first step of a needs assessment, which forms the initial stage of instructional design. No such studies have ever been conducted in the EFL context in mainland China, which is just a research gap that must be bridged.

Thus, this study aimed to identify the required subject matter content knowledge that would enable pre-service EFL teachers to teach phonics in mainland China. Therefore, the logical research question is: What specific subject matter content knowledge should pre-service EFL teachers possess to teach phonics in China? To this end, this study adopted mixed-methods, including both quantitative and qualitative approaches to identify the required knowledge deductively and inductively

2. Literature Review

2.1 Theoretical Foundation

The first theory that underpins this study is the Bottom-Up Theory of Reading Process, which suggests that reading development starts from the phoneme level (Papp, 2020). This theory supports the adoption of the phonographic approach in an EFL context to teach English early reading. Specifically, to achieve word-level automaticity, as required by the National English Curriculum, teaching should involve basic letter-sound relationships in a systematic and explicit manner (Amadi, 2019; ILA, 2019). This theory also contends that the chained sub-skills of early reading are reversible, enabling readers to manage decoding and encoding concurrently, while sight words might be helpful for early access and comprehension of the text (Papp, 2020). Thus, the goals of word-recognition automaticity and spelling in the National English Curriculum are attainable through explicit and systematic phonics instruction, which mainly refers to the theoretical synthetic phonics approach (Blevins, 2017; Papp, 2020).

The second theory underpinning this study is behaviourism learning theory. As Morrison et al. (2019) indicated, instructional design theory originates from learning theory. Behaviourism learning theory also impacts instructional design. More specifically, the instructional guide that will be developed based on the needs assessment results plays a role as the input or stimuli that potentially alter a group of adult learners' (pre-service EFL teacher) complex learning behaviour so that they attain the desired learning outcomes (Schunk, 2020). In other words, the subject matter content knowledge included in the instructional guide is formulated based on the needs assessment outcomes and will be a good knowledge source with which pre-service EFL teachers can acquire phonics subject matter content knowledge.

The third theory is the Andragogy Theory of Adult Learning (Knowles et al., 2015). This theory contains six assumptions, all of which imply the importance of a needs assessment before instructional design. Specifically, the Andragogy Theory of Adult Learning addresses the consideration of adult learners' learning needs to better motivate them to learn. Hence, a needs assessment is important in preparing them to learn specific knowledge or skills. In the present study, the guide was prepared for adult pre-service EFL teachers, so this theory is relevant.

2.2 Needs Assessment Framework

In light of the Andragogy Theory of Adult Learning, and as Branch (2018) and El-Amin (2020) noted, when motivating adult learners, making them realise their knowledge discrepancy is essential. A discrepancy, in a narrow sense, is the gap between their present knowledge and desired changes (Branch, 2018). Therefore, Macalister and Nation's (2020) needs assessment framework is appropriate as it includes the identification of learners' present knowledge and desired changes, based on the required knowledge base. As Macalister and Nation (2020) suggested, the required knowledge base can be generalised from previous literature or from the target situation. The present study attempts to generalise the required knowledge base from the above-mentioned sources.

2.3 Teachers' Knowledge Base

Initially, Shulman (1986) defined a teacher's knowledge base as containing two main aspects of knowledge: subject matter content knowledge and pedagogical content knowledge. Fundamentally, the former affects the latter, while pedagogical content knowledge, although derived from subject matter content knowledge, also supersedes subject matter content knowledge (Han et al., 2021; Shulman, 1986). More specifically, while a teacher must possess subject matter content knowledge, they also need pedagogical content knowledge to make pedagogical decisions (Mitton-Kükner & Murray-Orr, 2018) so they can effectively present the subject matter content knowledge. As Blevins (2017) noted, a teacher's subject matter content knowledge determines their pedagogical decisions while implementing phonics instruction. Moreover, Han (2011) noted that subject matter content knowledge can be acquired via training whilst pedagogical content knowledge is more dynamic and is developed from multiple sources, such as internships, teaching experience or observing experienced teachers lecture. In this regard, subject matter content knowledge precedes pedagogical content knowledge and is considered more essential. At present, the required knowledge base for phonics instruction is mainly narrowly conceptualised as the required subject matter content knowledge for phonics instruction.

The current study utilised both inductive and deductive approaches (Johnson & Christensen, 2019) to generalise the required knowledge from multiple sources to ensure the practicability and comprehensiveness of the generalisation. Hence, in this sub-section, a comparatively broad provisional knowledge base is generalised inductively from previous literature. In the EFL context in China, no studies have been conducted to investigate pre-service EFL teachers' knowledge base for phonics instruction, so no ready-to-use knowledge framework was available to follow or adapt. However, several previous studies have implied that in-service EFL teachers need to learn the following four aspects: i) basic notions of phonics; ii) phonics decoding rules; iii) phonics instruction approaches; iv) approach to instruct irregular words (Long, 2019; Yan, 2018; Zhao, 2019; Zhang, 2013; Zhong, 2020; Zhong & Kang, 2021). Nonetheless, to comprehend and contextualise the needs assessment, two knowledge frameworks that have been developed for the first language context were employed for reference. One is Hatcher's (2006) R+P framework and the other is the SSP (systematic synthetic phonics) Framework proposed by Manchester Metropolitan University [MMU] (2015). Thus, it was decided that the proposed required knowledge base could be informed inductively using the two frameworks and the previous literature in the EFL context in China: i) phonics general knowledge; ii) basic phonetic system knowledge; iii) phonemic awareness knowledge; iv) phonics decoding rules; v) phonics instruction approaches; vi) approaches to reinforcement; and vii) approaches to sight words. This provisional version functions as a basis for conducting the target situation analysis and will not be consolidated until the completion of this study.

3. Research Methods

3.1 Context & Research Design

This study was conducted in Mianyang City, Sichuan Province. The pre-service EFL teachers and teacher educators came from a local public teachers' college. Given that the required knowledge base for pre-service EFL teachers would be identified inductively and deductively, both quantitative and qualitative approaches were involved. More specifically, questionnaires and focus group discussions were adopted to collect data. As Macalister and Nation (2020) suggested, besides generalising the required knowledge from previous literature, the target situation is also an important source for such a generalisation. In the present study, the target situation analysis was conducted according to the schools' needs and teacher educators' perceptions. In this study, the term school refers to those full-fledged schools which provide full compulsory education from Grade 1-Grade 9. In this regard, a five-point Likert scale questionnaire and a focus group discussion were employed to collect data from the schools. Finally, another focus group discussion was held to collect data on the teacher educators' perceptions to consolidate the provisional required knowledge base.

3.2 Instrument

Three instruments were used in this study. The first was a five-point Likert scale questionnaire, which was adapted from Wahba (2019) and based on the provisional required knowledge base for pre-service EFL teachers. The questionnaire contained 30 items distributed across eight dimensions. The first dimension focused on collecting basic information, while the remaining seven focused on specific knowledge of the proposed required knowledge base. Since the instrument was an adapted version and applied in a different context, the reliability and validity were also checked in the pilot study. Specifically, as suggested by Dörnyei and Csizér (2012), the internal consistency was measured by using Cronbach Alpha coefficient and recommended a level of at least 0.7 for research purpose. For this instrument, the Cronbach's alpha coefficient value of 0.912. This result indicated a fair reliability. In addition, as suggested by Kumar (2019), Kaiser-Meyer-Olkin (KMO) and Bartlett test was used to determine the construct validity. The result showed a fair construct validity with KMO=0.920, $P < 0.001$

The second instrument was a focus group discussion adapted from Bennett (2017). This instrument aimed to obtain more profound information to supplement the questionnaire. It consisted of four open-ended prompts intended to gather data on i) pre-service EFL teachers' performance in phonics instruction; ii) their knowledge adequacy in relation to phonics instruction; iii) the necessary knowledge for phonics instruction; iv) an explanation of how to rate some items. This instrument was validated by four educators with professional expertise in phonology and pedagogy.

The third instrument was a focus group discussion for teacher educators and was adapted from Alsamadani (2017). The instrument consisted of seven open-ended questions related to the above mentioned provisional required knowledge framework. More specifically, the seven prompts were: what the specific knowledge should be included in, such as i) phonics general knowledge, ii) basic phonetic

system knowledge, iii) phonemic awareness knowledge, iv) phonics decoding rules, v) phonics instruction, vi) approaches to reinforcement, and vii) approaches to sight words. This instrument was also validated by four teacher educators.

3.3 Participants

The present study featured five full-fledged schools that conducted full education within the compulsory education system (from Grades 1 to 9). The schools had long-term cooperative relationships with the teachers’ colleges, which employed graduates and provided internships for pre-service EFL teachers. In other words, the schools were selected via purposive and convenience sampling. Permission was granted by the principals and related staff members who were willing to join this study and share their experience. Furthermore, all the 146 English teachers from the five schools who were also supervisors of pre-service EFL teachers were invited to complete the questionnaire. They are referred to as EFL teachers who were appointed as practicum supervisors. For the focus group with schools, seven EFL group directors from the five schools volunteered to attend. For the other focus group discussion with teacher educators, five teacher educators with professional expertise in phonology and pedagogy volunteered to join.

3.4 Data Collection and Analysis

To understand school staffs’ beliefs about the required knowledge base of phonics instruction for pre-service EFL teachers, a questionnaire was distributed to the 146 EFL teachers who were appointed as practicum supervisors via a QR code from an online app. It was suggested that they return the questionnaire as soon as possible and at least three days before the focus group discussion so that adequate time would be available to analyse the data collected through the questionnaire in preparation for probing or obtaining more specific information from the subsequent focus group discussion. The data collected from the questionnaire were turned into numerical data and analysed quantitatively. Descriptive statistics were yielded to understand the school staffs’ expectations of pre-service EFL teachers in regard to the knowledge they need to teach phonics.

The first focus group discussion was conducted with seven EFL group directors from five schools in a meeting room. They were invited to share their opinions on the performance of pre-service EFL teachers when instructing phonics during their internships and on the proposed required knowledge base for phonics instruction. Besides complementing the questionnaire results, the qualitative data from this focus group discussion was intended to recognise the pre-service EFL teachers’ current competencies in phonics instruction during their school internships. In addition, some of the questionnaire results were probed further to explain school staffs’ views on the specific target knowledge needed to teach phonics. The discussion was transcribed, coded and reviewed according to the qualitative content analysis process. More specifically, both the direct content analysis and conventional content analysis approaches were adopted to ensure the data were fully interpreted under suitable themes or subthemes and to avoid oversimplification (Hsieh & Shannon, 2005; Zhang & Wildemuth, 2009). During the coding process, the constant comparison method was also applied to ensure that the whole text dataset was examined to identify potential themes (Krueger & Casey, 2015).

The second focus group discussion was conducted among five teacher educators with professional expertise in phonology and pedagogy. The discussion focused on consolidating the proposed required knowledge base in preparation for conducting a further needs assessment among pre-service EFL teachers. During the discussion, all five educators expressed their own beliefs about consolidating the required knowledge base. As with the previous focus group discussion, the qualitative text data were recorded, transcribed, coded and reviewed. The same data analysis methods were adopted.

4. Findings

The findings from the questionnaire and the two focus group discussions conducted with the EFL group directors and educators are reported respectively. First, the questionnaire findings are reported.

4.1 Findings of the Questionnaire

In total, 146 questionnaires were distributed to EFL teachers who were appointed as practicum supervisors in five different schools. Table 1 below shows the distribution of the respondents.

Table 1. Distribution of respondents from five schools

Schools	No. of respondents	Percent %
1	24	16.4
2	27	18.5
3	26	17.8
4	39	26.7
5	30	20.5
Total	146	100

As indicated in table 1, 146 valid questionnaires were returned from five schools. Of these, 16.4% of the respondents came from school 1, representing the fewest respondents. School 4 provided most of the respondents, 26.7% of the total population. Tables 2 and 3 below show the gender and age distribution of the respondents.

Table 2. Gender distribution of the respondents

Gender	Frequency	Percent %
Valid F	121	82.9
Valid M	25	17.1
Total	146	100

Table 3. Age distribution of the respondents

Age	Frequency	Percent %
25-30	42	28.8
35-40	38	26
40-45	52	35.6
45-50	14	9.6
>50	0	0
Total	146	100

Tables 2 and 3 indicate that there were 121 female and only 25 males. Most respondents were aged between 40 and 45. Table 4 below shows the findings of respondents’ preferences in decreasing order.

Table 4. Respondents’ Preferences in Decreasing Order (N=146)

Rank No.	Item/topic: the need to learn:	SD	D	U	A	SA
		Respondents %				
1	S5-5: phonograms	-	-	-	40.4	59.6
2	S5-2: short vowel sounds	-	-	-	41.1	58.9
3	S5-3 long vowel sounds	-	-	-	39.7	60.3
4	S5-1: consonant sounds	0.7	-	-	43.1	56.2
5	S5-4: other vowel sounds	0.7	-	-	40.4	58.9
6	S6-1: synthetic phonics instruction	0.7	-	-	48.7	50.7
7	S2-2 prerequisites of phonics instruction	0.7	0.7	0.7	45.2	52.7
8	S2-3 terminologies of phonics	0.7	-	1.4	49.3	48.6
9	S2-1 phonics definition	2.1	-	-	49.3	48.6
10	S8-3: definition of irregulars	0.7	-	1.4	54.1	56.2
11	S8-4: approaches to tackle irregulars	-	0.7	2.1	48.6	48.6
12	S6-2: analytic phonics instruction	0.7	-	2.1	41.7	55.5
13	S6-3: analogy phonics instruction	1.4	-	1.4	44.5	52.7
14	S6-4: alphabet recognition instruction	-	1.4	1.4	52.1	45.2
15	S3-4: 44 speech sounds	0.7	7.5	15.8	54.8	21.2
16	S3-1: categories of syllables	-	12.3	15.8	54.1	17.8
17	S4-2: importance of phonemic awareness	1.4	6.8	22.6	51.4	16.9
18	S8-2: definition of high frequency words	-	8.9	24	55.5	11.6
19	S7-2: activities to reinforce decoding rules	0.7	10.3	22.6	50.7	15.8
20	S3-3: phoneme counting	-	8.9	24.7	51.4	15.1
21	S3-2: consonant articulation	2.1	11.0	20.5	45.9	20.5
22	S4-3: how to instruct phonemic awareness	0	15.1	19.2	50.0	15.8
23	S4-1: connotations of phonemic awareness	0.7	8.2	26.7	48.6	15.8
24	S4-4: phonemic awareness assessment	1.4	11.6	24	50.0	13
25	S7-1: benefits of decodable readers	-	14.4	23.3	47.9	14.4
26	S2-4 purpose of phonics instruction	1.4	12.3	24	50.7	11.6
27	S8-1: definition of sight words	1.4	10.3	22.1	53.5	13.4

The findings in table 4 reveal the respondents’ expected knowledge base that should be acquired by pre-service EFL teachers through the teacher preparation program. Firstly, most items that were definitely preferred were in section 5. This indicates that almost all the respondents working in schools expected the required knowledge base to include basic phonics decoding rules, especially short vowel sounds, long vowel sounds, consonant sounds, other vowel sounds as well as phonograms.

Secondly, the findings revealed that almost all the items in the phonics instruction approach section (section 6) were highly preferred. The total percentage of the “Agree” and “Strongly Agree” responses to the four items in this section was above 97%. This indicates that almost all the respondents expected phonics instruction approaches to be included in the required knowledge base for pre-service EFL teachers when learning to teach phonics. Specifically, the synthetic phonics instruction approach was ranked higher than the other two approaches, reflecting the respondents’ expectations that pre-service EFL teachers would explicitly and systematically learn how to teach phonics.

Thirdly, table 4 illustrates that almost three in four items in the phonics-related general knowledge section (section 2) were highly rated, up to 98%. Thus, the respondents considered that pre-service EFL teachers should know about phonics, terminologies and the prerequisites for phonics instruction, with the item ‘knowing why phonics should be instructed’ prioritised, because item S2-4 (the purpose of phonics instruction) was only rated as 64.9%.

Fourthly, of the items in the sight words instruction approach section (section 8), two were outliers: what are irregulars and how to tackle

irregulars. This indicates that the respondents expected pre-service EFL teachers to know how to explain irregular words to their students. Fifthly, comparatively, the respondents rated target knowledge in the phonemic awareness section (section 4), the sound system section (section 3) and the phonics decoding rules maintenance section (section 7) lower than target knowledge in other sections, although their preferences were all above 60%. This indicates that they might not consider the target knowledge in these three sections as important as the target knowledge in other sections.

4.2 Findings of Focus Group Discussion with EFL Group Directors

Five themes were generalised from the qualitative analysis of the focus group discussion with the EFL group directors: “Internship Performance”, “Knowledge Inadequacy”, “Core Knowledge”, “Complementary knowledge” and “Secondary Knowledge”. The findings under each theme are reported below in table 5.

Table 5. Findings from Focus Group Discussion with EFL group directors

Sub-Categories	Descriptions
Internship Performance	<u>Directors commented on pre-service EFL teachers’ performance:</u> A. Not quite satisfactory B. Needs further professional training in light of core competencies required by the curriculum C. Hard-working D. Well-motivated to learn and teach
Knowledge Inadequacy	<u>Directors pointed out pre-service EFL teachers’ knowledge inadequacy:</u> A. Not familiar with phonics at all B. Not familiar with National English Curriculum C. Do not know how to teach phonics D. Unable to explain challenging words E. Weak in designing a curriculum and lesson planning
Core Knowledge	<u>Directors considered core knowledge as:</u> A. Phonics decoding rules B. Phonics instruction approaches C. Approaches to deal with irregular words D. Phonics-related knowledge E. English sound system knowledge
Secondary Knowledge	<u>Directors considered core knowledge as :</u> A. Decoding rules reinforcement approach B. Phonemic awareness
Complementary Knowledge	<u>Directors considered complementary knowledge as :</u> A. Lesson Planning & Curriculum design

As shown in table 5, following the focus discussion prompts, the directors first commented on the pre-service EFL teachers’ performance during their internships. Overall, the directors were not quite satisfied with the pre-service EFL teachers’ performance in English phonics teaching activities. The directors believed there was adequate space for pre-service EFL teachers to make further progress through professional training during the teachers’ preparation program, which should be reformed along with the new National English Curriculum. However, they confirmed that the pre-service EFL teachers were highly motivated to learn to teach during their internships and tried their best. For instance, some directors commented as follows:

director 2: “They were pretty hard-working and tried to follow the supervisors in class to learn to teach better.”

director 1: “They understand their teaching competence needs to be refined. I really suggest [that] your college can consider reforming the courses in the training program to prepare them, with consideration of the core competencies required by the National English Curriculum, especially in [terms of phonics].”

Secondly, the directors found that the pre-service EFL teachers were not familiar with the phonics requirements in the National English Curriculum. Some did not even know what phonics is or how to teach phonics, not to mention how to explain irregular words. They also noted that the pre-service EFL teachers were unfamiliar with curriculum design or planning lessons based on textbooks. The directors suggested providing professional training on those aspects. The following examples indicate these issues:

director 2: “...in the class observation, I found she likes to write International Phonetic Symbols after new words and ask students to read after her when phonics decoding rules should be applied... After class, we discussed the demo teaching, [and] she said she had not heard about phonics and did not know how to do it...”

director 5: “[It is] similar in our school. One of the pre-service EFL teachers came to ask me how to explain the pronunciation of the word “have” when I taught long-A sound regulations in class.”

director 7: *“Yes, I agree with them, without basic knowledge, they did not even know how to write a lesson plan with reference to the National Curriculum.”*

Thirdly, based on the aforementioned questionnaire, the directors discussed the target knowledge with reference to the national curriculum and suggested that the required knowledge to teach phonics should include phonics decoding rules, phonics instruction approaches, phonics-related general knowledge, sound system knowledge and sight words instruction (irregulars) as the core target knowledge. This was because they commented that the National English Curriculum implied that pre-service EFL teachers should at least understand what phonics is, how to teach it and how to explain irregular words to their students. Knowledge of the English sound system is also important because the IPA was also required by the curriculum. For example, directors 6, 1 and 7 emphasised:

director 6: *“As a pre-service EFL teacher, since phonics is required from primary schools onward in the National English Curriculum, basically, phonics decoding rules should be acquired by the pre-service EFL teacher first, then [they should] ... learn to teach [it].”*

director 1: *“For junior middle school students, the International Phonetic Alphabet is also required by the National English Curriculum. It must be included as the core knowledge.”*

director 7: *“To possess basic knowledge about syllables can help [teachers to] learn and teach phonics.”*

Fourthly, the directors considered that decoding rules maintenance knowledge and phonemic awareness knowledge were less useful as they did not regard phonemic awareness as required in the national curriculum or in a practical context, so it was unnecessary to instruct it purposefully. In terms of decoding rules maintenance knowledge, they considered that drills from textbooks were sufficient to reinforce the rules and that no extra class periods could be assigned to reinforce these rules. As directors 4 and 3 explained:

director 4: *“...we only assign four class periods to English every week, [so] no extra time can be assigned on extra drills [in addition to those in] the textbooks...”*

director 3: *“I agree to exclude phonemic awareness knowledge as it was not required by the curriculum and as long as the students can recognise words using decoding rules, the teaching goals [will have been attained].”*

Lastly, a new finding emerged from this focus group discussion. Most directors suggested including lesson planning or curriculum design content in the required knowledge base because the National English Curriculum requires that the teachers possess the knowledge and skills to plan lessons, design a curriculum and develop textbooks. As director 2 pointed out, planning a lesson well and developing a curriculum for a course form part of the core competencies of a teacher. Directors 2 gave a further explanation:

director 2: *“Core competencies was defined by the curriculum as the practical ability to produce knowledge and manage the knowledge efficiently. It is essential in such a knowledge-based society in which knowledge plays a key role in individual success and career success. I strongly suggest [that] your college ... prepare ... pre-service EFL teachers with the core competencies, basically to equip them with the necessary knowledge and skills for teaching in our schools, such as how to teach phonics, how to plan the lessons and how to conduct phonics instruction.”*

4.3 Findings of Focus Group Discussion with Educators

The findings of the focus group discussion yielded two basic themes, namely, “knowledge to include” and “knowledge to exclude”. The purpose of this focus group discussion was to consolidate the proposed knowledge base on phonics instruction with reference to previous literature, the national English curriculum, the school staffs’ needs (as determined through the questionnaire and focus group discussion) as well as researchers’ beliefs. The findings are presented in table 6 below.

Table 6. Findings from focus group discussion with educators

Sub-Categories	Descriptions
Knowledge to include	<u>Educators decided to include the following knowledge dimensions:</u> A. Phonics-related general knowledge B. Phonics decoding rules C. Phonics instruction approach D. Decoding rules reinforcement approach E. Sight words instruction approach F. English sound system
Knowledge to exclude	<u>Educators decided to exclude the following knowledge dimensions:</u> A. Lesson plans & Curriculum design

As indicated in table 6, all the educators decided to include the seven knowledge dimensions in the required knowledge base for phonics instruction. In the previous focus group discussion, the EFL group directors stated that decoding rules maintenance and phonemic

awareness knowledge were less important. However, the literature showed that learning Chinese Pinyin can foster phonemic awareness before learning English (Pan, 2011), and educators considered that possessing the knowledge and skills of phonemic awareness may assist in learning and teaching phonics because phonemic skills such as blending and segmenting can be used to teach phonics. This was emphasised by, for example, Educator 4, as follows:

educator 4: "...the phonemic awareness skills, such as substituting sounds in a word, [are] also essential in teaching phonics [through] analogy..."

Meanwhile, the educators suggested retaining the decoding rules maintenance approach as they deemed that such skills might be adopted in class teaching to enhance EFL beginners' confidence. For instance, Educator 5 pointed out:

educator 5: "If the pre-service EFL teachers understand the benefits of using decodable text, they may have more pedagogical choice while helping their students [to review] the acquired rules."

Lastly, the educators deemed that curriculum design and lesson planning should not be included in the phonics instruction knowledge base because they considered that this content should be included in the Course Design module rather than the Phonology course. However, they suggested that phonics lesson planning be included while developing the guide to offer an example to pre-service EFL teachers and vividly illustrate phonics instruction procedures. For example, Educator 2 pointed out:

educator 2: "We have specific courses such as Course Design and Micro Course Design to teach [the teachers] how to develop the lesson plan and curriculum, and this knowledge base is specifically for phonics instruction, so I suggest not mixing them up"

Thus, the decision on the seven knowledge dimensions to include in the proposed required knowledge base was generalised from the previous literature and the framework suggested by Macalister and Nation (2020). The proposed knowledge base for phonics instruction was then consolidated.

5. Discussion

This study aimed to identify the required knowledge base for pre-service EFL teachers to teach phonics. The findings may have a major impact on the capacity to recognise their present knowledge and desired changes, with the further purpose of developing a phonics instructional guide to prepare them for instructing phonics explicitly and systematically. Investigation into the required knowledge base is also essential as it remains an under-researched domain. Thus, this study yielded several new findings which worthy of being discussed.

In the EFL context in China, as previous literature indicates, in-service EFL teachers were not familiar with basic phonics knowledge, such as what phonics means, specific decoding rules, phonics instruction approaches and methods of dealing with irregular English words (Long, 2019; Zhao, 2019; Zhong, 2020). In the same vein, the findings of the current study's focus group discussions revealed a similar knowledge inadequacy among pre-service EFL teachers. It is important to note that the focus group discussion yielded a new finding: the pre-service EFL teachers were weak in lesson planning and designing a course curriculum for phonics, which has not been reported in previous studies in the EFL context in China. This phenomenon can be fundamentally attributed to their inadequate knowledge of understanding phonics and phonics instruction, which reflects the connotations of the knowledge base. Under the umbrella term of the knowledge base, subject matter content knowledge provides the grounding for pedagogical content knowledge, which logically has a further impact on curricular knowledge (Han, 2011; Howey & Grossman, 1989; Zhang, 2019). Therefore, the EFL group directors suggested that subject matter content knowledge should be included in the required knowledge base for phonics instruction as teachers must rely on their knowledge base for their further pedagogical choices and actions (Blevins, 2017; ILA, 2019; Zhang, 2019). More specifically, when the teachers comprehend the subject matter content knowledge of phonics instruction, they might be able to prepare to present the knowledge in an easily understood and organised way, with proper examples, demonstrations and explanations. Then, they might be able to select a suitable instructional repertoire that would include organising, managing and arranging the content to suit a certain teaching approach. They would also be able to adapt or tailor materials according to their students' specific needs, such as their characteristics, abilities and learning aptitude, as well as design the course curriculum for instruction, evaluation and reflection (Shulman, 1987; Zhang, 2019). In the final analysis, subject matter content knowledge of phonics is fundamental to pre-service EFL teachers so they can develop professionally into qualified in-service EFL teachers. This also explains why all the educators in the group discussion agreed to include all seven knowledge dimensions in the required knowledge base for phonics instruction and to exclude lesson planning and curriculum design content because, as mentioned, lesson planning and curriculum design or course design were derived from a fundamental knowledge of the subject matter content (Shulman, 1987; Howey & Grossman, 1989; Han, 2011; Kultsum, 2017; Zhang, 2019).

Besides, the EFL group directors suggested including lesson planning and curriculum knowledge as supplementary target knowledge in the knowledge base to teach phonics. This is another new finding in the EFL context in China. It is in accordance with MMU (2015), which required pre-service teachers to demonstrate good subject matter knowledge, along with curricular knowledge and lesson planning ability. However, the educators considered that in reality, the required knowledge was specifically for the phonology course, while the specific curriculum design course for pre-service EFL teachers included planning lessons. Thus, the educators suggested including only a systematic and explicit demo lesson plan in the final version of the instructional guide to set an example to the pre-service EFL teachers in

relation to their learning pedagogical content knowledge. This would include how to organise lessons, select proper examples and demonstrations, as well as presenting content. This would be aside from deriving the fundamental subject matter content knowledge and could also be developed from learning through materials, other teachers' teaching experience and observation (Han, 2011; Howey & Grossman, 1989; Zhang, 2019). Furthermore, from the behaviourist perspective, the guide could play a reinforcement role, which is considered a knowledgeable source with which to transmit knowledge to receivers and hence obtain the expected learning outcomes (Budiman, 2017; Robinson, 2018). Thus, it was deemed reasonable to include example lesson plans to show pre-service EFL teachers how to present phonics instruction approaches.

Another noteworthy new finding was yielded from the focus group discussion with the EFL group directors: the pre-service EFL teachers were unfamiliar with the National English Curriculum requirements, which accounted for their ignorance of phonics knowledge. This finding has not been reported by any other studies to have addressed EFL teachers' knowledge of phonics teaching. Only scarce literature is available to be compared and discussed. One possible reason for the teachers' poor understanding of the phonics-related requirements in the curriculum might be that before 2011, in the compulsory education phase (Grade 1-9), only the IPA was taught when learning to read English vocabulary (Long, 2019), which meant the pre-service EFL teachers had not learned or even heard of phonics before. After enrolling in the college EFL program, the IPA was taught again in phonology class to improve their own pronunciation, which may have led to their confusion about the IPA and phonics. Even if the curriculum requires basic decoding rules, they may consider these to be IPA codes. Overall, this finding implies that further investigation is needed into the Study of Curriculum and Textbooks course, which is intended to prepare these teachers with a better understanding of the curriculum and the related textbooks. Then, they would understand the importance of phonics in teaching and learning English as a foreign language and be able to positively identify which phonics content to emphasise to EFL learners. This might be another possible research route.

Also, findings of this study yielded several empirical and pedagogical implications. For instance, the new empirical findings related to the pre-service EFL teachers' knowledge discrepancies in lesson planning and curriculum design imply that further investigation is needed into the existing curriculum design course. This course might also be reformed to involve phonics instruction approaches and focus more on practical activities rather than conceptual theories. Second, empirically, the consolidated required knowledge base was generalised from the previous literature, the survey of the EFL teachers who were practicum supervisors and the focus group discussions with the EFL group directors and educators. This material indicated the need for a further needs assessment and the development of a phonics instructional guide to be adopted in the teacher preparation program, which would further reform the existing phonology courses in light of the newly released National English Curriculum in 2022. Third, the empirical findings related to the required knowledge base to teach phonics might also be applicable when investigating in-service EFL teachers' present knowledge and desired changes during their follow-up professional training (as required by the National English Curriculum). This is because, as previous literature has indicated, some in-service EFL teachers also have a knowledge discrepancy in this area. This is also an unexplored field. Pedagogically, the empirical data yielded from the EFL group directors' perspectives provided preliminary insights into the pre-service EFL teachers' present knowledge, implying what needs to be strengthened through the teachers' training program. Teacher educators and policy makers can use this as a reference for further investigation into the pre-service EFL teachers' specific learning needs, as required by the national curriculum. This would enable improving reforms to the courses in the program and enable a more suitable course curriculum to be designed.

6. Conclusion

To conclude, instructional design starts from a needs assessment, in which the first step is to decide the required knowledge base, after target trainees' present knowledge and desired changes are identified (Macalister & Nation, 2020). This is also an unexplored domain in China, and the purpose of this article was to identify the required knowledge base of phonics instruction for pre-service EFL teachers in China to bridge this research gap. The findings of this study, definitely answers the primary research question: "What specific subject matter content knowledge should pre-service EFL teachers possess to teach phonics in China?". Although perhaps the findings were specific to a certain context and not generalisable to much broader groups, they provide a preliminary scenario when attempting to identify the required knowledge base that pre-service EFL teachers should learn so that they can teach phonics. The new findings may add a new element to the existing body of literature and hope this study may enlighten researchers from other EFL cultures to investigate more in this field to promote better implementation of phonics in EFL context.

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