



P-ISSN 2355-2794
E-ISSN 2461-0275

The Effectiveness of an Instructional Guide on Chinese Pre-Service EFL Teachers' Knowledge in Teaching Phonics

Minjie Chen^{1,2}
Hock Seng Goh^{*,1}
Ruey Shing Soo³
Guojie Yin²

¹Department of English Language and Literature, Faculty of Languages and Communication, Universiti Pendidikan Sultan Idris, Tanjung Malim, Perak, 35900, MALAYSIA

²Mianyang Teacher's College, Mianyang City, Sichuan Province, 621000, PEOPLE'S REPUBLIC OF CHINA

³Faculty of Language and Communication, Universiti Malaysia Sarawak, Kota Samarahan, Sarawak, 94300, MALAYSIA

Abstract

In China, phonics instruction has been given substantial emphasis ever since the implementation of the 2011 National English Curriculum for Compulsory Education. However, many Chinese students' learning outcome remains unsatisfactory due to EFL teachers' insufficient knowledge to teach phonics and the absence of a phonics instructional guide. To address this gap, this study aims to investigate the effects of a newly developed phonics instructional guide on Chinese pre-service EFL teachers' knowledge base to teach phonics. Adopting an experimental research design, the study was conducted at a teachers' college in Sichuan Province, China. There were 172 pre-service EFL teachers assigned into two equivalent groups, namely the experimental group (N=86) and control group (N=86), who took a test respectively before and after the intervention. The measures of the test included seven dimensions aiming to elicit knowledge of general phonics, phonetic system, phonemic awareness, phonics decoding rules, phonics instructions, reinforcement methods, and sight word instructions. The experimental group participants

* Corresponding author, email: goh.hs@fbk.upsi.edu.my

Citation in APA style: Chen, M., Goh, H. S., Soo, R. S., & Yin, G. (2022). The effectiveness of an instructional guide on Chinese pre-service EFL teachers' knowledge in teaching phonics. *Studies in English Language and Education*, 9(2), 554-573.

Received September 21, 2021; Revised January 15, 2022; Accepted April 16, 2022; Published Online May 23, 2022

<https://doi.org/10.24815/siele.v9i2.22780>

undertook a 15-hour phonics training course using the newly developed Phonics Instructional Guide (PHOInG). The control group participants were taught using a conventional method involving the use of an English textbook prescribed by the college. Results revealed that the Chinese pre-service EFL teachers in the experimental group improved significantly in their overall knowledge base of English phonics and phonics instruction, except for phonemic awareness and knowledge of the phonetic system. These findings point to the importance of using a needs-based and theoretically informed instructional guide when providing phonics and phonics instruction training to Chinese EFL pre-service teachers.

Keywords: Phonics instruction, pre-service EFL teachers, instructional guide, knowledge base.

1. INTRODUCTION

The Chinese educational reform which took place in 2011 witnessed a call for a change in English language teaching when phonics instruction was given a greater emphasis in the newly launched National English Curriculum for Compulsory Education (NECCE). This is especially applicable for primary school students who are in their grade 1 to grade 6 of elementary education. Fundamentally, following this new curriculum, EFL (English as a Foreign Language) students are highly expected to master 26 letters in the English alphabet with basic concepts of phonemic awareness and the ability to grasp the basic letter-sound relationship to attain automaticity in word recognition. This grapho-phonics cueing system is essential in the early reading process (Gopal & Mahmud, 2018; Gopal & Singh, 2020). With the mastery of this knowledge, the EFL students are predicted to be able to achieve basic reading automaticity at the word level (Nasir et al., 2019).

Although all EFL instructors are made aware that teaching phonics will benefit EFL students in several aspects of skills enhancement, such as word recognition and spelling (He, 2018; Liu, 2019; Zhang, 2019), the expected student learning outcome remains unsatisfactory. This could be attributed to the poor implementation of phonics instruction due to EFL teachers' weak knowledge base to teach phonics (Long, 2019; Yan, 2018; Zhao, 2019; Zhong, 2020; Zhong & Kang, 2021). As reported in several previous studies conducted in the Chinese EFL learning context, most of the EFL teachers or novice teachers expressed that they lacked knowledge in general phonics and were often confused with the International Phonetic Alphabetic system which then caused them to be unable to identify phonics contents in the textbooks prescribed to them. In some instances, although the teachers could identify the phonics-related contents, they still preferred to teach them in the form of IPA which they were taught before (Zhao, 2019). Furthermore, some of them underestimated the function of phonics and chose to ignore phonics contents because they either did not know the value of phonics instruction or they had no idea how to teach them (Long, 2019; Yan, 2018).

In a similar vein, some novice EFL teachers expressed that they encountered problems in teaching phonics. Aside from the above-mentioned problems, they had little knowledge of phonics decoding rules and lacked the confidence to teach phonics

in class because they did not know how to explain irregulars in phonics. Also, many of them expressed that they did receive professional training in the teachers' preparation program but they were not taught using any phonics instructional guide (Long, 2019; Yan, 2018; Zhao, 2019; Zhong, 2020). Thus, it can be deduced from here that Chinese EFL teachers need an instructional guide to assist them in teaching English phonics in class. This also aligns with the 2021 National English Curriculum which calls for EFL teachers to update their subject matter content knowledge, including phonics instruction (Ministry of Education, 2011).

To address the aforementioned knowledge gap among Chinese EFL teachers, this study aimed to investigate the effectiveness of a newly developed, needs-based, and theoretically informed phonics instructional guide on Chinese pre-service EFL teachers' knowledge base in teaching phonics. This instructional guide was developed based on needs assessment outcomes and aimed at improving Chinese pre-service EFL teachers' knowledge of implementing explicit and systematic phonics instruction. Furthermore, the aim of this study was guided by the research question:

- Is the instructional guide effective in assisting pre-service EFL teachers to acquire subject matter content knowledge for phonics instruction?

To answer this question, the null hypothesis was set: H0: There is no causality between the input received in the phonics instructional guide and the Chinese pre-service EFL teachers' change of knowledge in implementing phonics instruction. The alternative hypothesis (H1) is: There is a positive causality between the input received in the phonics instructional guide and the Chinese pre-service EFL teachers' change of knowledge in implementing phonics instruction.

2. LITERATURE REVIEW

2.1 Theoretical Framework

This study was underpinned by the Behavioural Learning theory (Schunk, 2020), Bottom-up Theory of the Reading Process (Amadi, 2019) as well as Andragogy Theory of Adult Learning (Knowles et al., 2015). They are explained in the next subsections.

2.1.1 Behavioural Learning Theory

Behaviourists posit that (language) learning occurs through the sourced stimuli to cause the behavioural response or output, knowledge, or skills to be transmitted from more knowledgeable sources to less informed ones (Robinson, 2018). In light of this principle, Skinner's concept of 'instrumental conditioning' in the Stimulus-Response (S-R) theory suggests that when the right stimulus is given, and learners' positive learning outcomes are reinforced, they would continue to learn and improve (Nazir, 2018; Schunk, 2020). Also, as Budiman (2017) and Morrison et al. (2019) asserted, instructional design is rooted in learning theories, and instructors are the ones who manipulate the input in the learning environment to alter learners' behaviours. Hence, the instructors' knowledge base, especially subject matter content knowledge, is critical for delivering the stimulus (Syamdianita & Cahyono, 2021). Based on that, this study holds that the proposed phonics instructional guide, which serves as the

stimulus, could assist Chinese pre-service EFL teachers in acquiring subject matter content knowledge to implement phonics instruction. When they experience the positive outcome following the training using the instructional guide and regard the learning as a rewarding experience, their teaching practice will certainly be reinforced which in turn promotes their EFL students to read at the word level.

2.1.2 Bottom-up Theory of the Reading Process

The present study is also premised on the Bottom-up Theory of the Reading Process's assumption that the early reading process should start with the basic and smallest unit of a language, which includes recognizing the alphabet, simple letter-sound relationships to more complex components, and word chunks (Gopal & Singh, 2020). In line with this, the direct and explicit phonics instruction approach is deemed a more relevant phonics instruction approach because it stems from basic phonics decoding rules to a more advanced layer (Tahir et al., 2021). This approach is also recommended for all English language beginners to learn how to read (Blevins, 2017; International Literacy Association, 2019). Following this claim, the central focus of the proposed phonics instructional guide should adopt an explicit and systematic synthetic phonics approach so that pre-service EFL teachers can be equipped with the knowledge and skills to teach phonics. In turn, they could help their students to learn phonics to attain reading automaticity on word level.

2.1.3 Andragogy Theory of Adult Learning

Andragogy Theory of Adult Learning (Knowles et al., 2015) also sheds light on this study. This theory emphasizes the learning needs of adult learners such as pre-service EFL teachers who possess a desire to learn practical and useful knowledge for their own future careers (El-Amin, 2020). This implies that instructional design should be guided by the basis of needs assessment to ensure the quality of an instructional product and to meet adult learners' learning needs (Iswati & Triastuti, 2021; Morrison et al., 2019). This theory also prognosticates that when training caters to adult learners' needs or gears towards solving their real-life problems, the adult learners are prompted to learn and learning could happen as expected (El-Amin, 2020; Knowles et al., 2015). Hence, to ensure the effectiveness of the phonics instructional guide, the guide was designed and developed following a needs assessment of the pre-service EFL teachers.

2.2 Development of Phonics Instructional Guide

The design, development, implementation, and evaluation of the proposed Phonics Instructional Guide (PHOInG) follows the ADDIE (Analyse, Design, Develop, Implement, and Evaluate) instructional design sequential framework (Branch, 2018; Knowles et al., 2015). Following the ADDIE guideline, the contents of PHOInG were first determined via a needs assessment. The assessment outcomes were then consolidated and rationalised based on the required knowledge base generalized from previous literature, as advised by Nation and Macalister (2010).

The ADDIE instructional design sequential framework, as its name suggests, consists of five phases: (i) analysis, (ii) design, (iii) development, (iv) implementation, and (v) evaluation (Surdyanto & Kurniawan, 2020). For the present study and as part

of multi-phase research, the ‘needs assessment’ was undertaken by examining the pre-service EFL teachers’ present knowledge about phonics and phonics instruction and their desired changes in light of the Andragogy Theory of Adult Learning. This theory emphasises that adult learners, such as pre-service EFL teachers in this study, have the right to make decisions on what they lack, what they want to learn as well as what problems they intend to solve through training (Branch, 2018; El-Amin, 2020). This clearly justified the need to conduct the needs assessment before designing the guide. The needs assessment phase was followed by the ‘design’ of the instructional guide. This involved determining the instructional goals, objectives, contents, and materials. This is a decision-making stage in which the designers have to evaluate various factors that may affect the effectiveness and feasibility of the proposed instructional guide for phonics instruction training. In the next phase, all the finalised plans, materials, and evaluation tools were ‘developed’, aligning with the pre-determined goals and objectives (Nafiah, 2020). This stage was then followed by the implementation or experiment in this study. Here, the instructional materials or guide were tried out with proper instructional strategies decided earlier in the design phase. For the present study, Gagné et al.’s (2005) ‘Nine Strategies of Instruction’ was adopted for implementation. The purpose of implementation was to obtain summative information on the effectiveness of the instructional guide (Johnson & Bendloph, 2018).

Lastly, the summative information pertaining to the effectiveness of PHOInG was evaluated by the researchers and the research participants. This was pertinent because finding out its effectiveness may help to evaluate the extent to which the prepared guide and materials have helped the pre-service teachers to achieve the targeted learning outcomes. In other words, it could reflect on what and how much has been learned to locate the strengths and weaknesses of the instructional guide and provided evidence for further improvement (Branch, 2018). Also, the research question of this study was answered through the evaluation.

The finalised contents of PHOInG consist of seven sets of the knowledge base (dimensions) on phonics and phonics instruction that Chinese pre-service EFL teachers need to learn, including (1) phonics-related general knowledge, (2) basic knowledge of the English sound system, (3) knowledge about phonemic awareness, (4) phonics decoding rules, (5) phonics instruction approach with systematic synthetic phonics instruction as the focus, (6) decoding rules reinforcing approach, and (7) sight words instruction approach. In conclusion, the proposed PHOInG, primarily based on systematic synthetic phonics, was developed to improve Chinese pre-service EFL teachers’ knowledge base to implement explicit and systematic phonics instruction.

3. METHODS

3.1 Context, Sampling, and Participants

This experimental study was carried out in one teachers’ college in Mianyang City, Sichuan Province, P. R. China. The participants were 172 pre-service EFL teachers enrolled in a 4-year full-time bachelor’s degree programme in teacher education. To enrol into this programme, they had to fulfil a general entry requirement, namely to pass the National College Entrance Examination (NCEE) or the generally called ‘Gaokao’ (高考) in China. Additionally, in order to be enrolled in the college’s

English Department, a good score in the English Subject of NCEE was required. On the whole, the average score of the 1243 pre-service EFL teachers enrolling in the department was 126.8 out of the maximum score of 150 in English.

To select a representative sample from the 1243 pre-service teachers in the department, a stratified random sampling (Johnson & Christensen, 2019) method was utilized, in which the samples were chosen from four existing strata (academic year) in the form of four intact classes. As a result, 172 samples were chosen to participate in the present study, and the distribution were freshmen (N=39), sophomore (N=41), junior (N=48), and senior (N=44). To be specific, one intact class was selected randomly from each academic year. The sample size was 13.83%, which fulfilled the optimal ratio above the minimal 10% of the population (Creswell & Creswell, 2018). After administration of the pre-test on the 172 representative samples, they were assigned to the control group (N=86) and experimental group (N=86) via group matching technique after the pre-test scores were sorted from high to low (Johnson & Christensen, 2019).

3.2 Data Collection and Instruments

Employing a multi-phase study design based on the ADDIE instructional design sequential framework, the data collection procedure was divided into four phases. In Phase I, after identifying the 172 representative samples (Johnson & Christensen, 2019), a needs assessment was conducted. In Phase II, the instructional guide was prepared. In Phase III, first, a pre-test was administered on the 172 representative samples. Then, they were assigned to the experimental group (N=86) and control group (N=86) by group matching technique (Johnson & Christensen, 2019). The experiment was conducted where trainees in the experimental group were taught phonics and phonics instruction using the developed PHOInG, whereas participants in the control group were taught using the prescribed English textbook. Due to the tight schedule and the permission granted, both groups undertook five training sessions for three hours for each training session. Before conducting the actual experiment, a pilot study was conducted to examine the feasibility of the training. The feasibility study results showed that the duration of the training was sufficient to produce a 'measurable effect' (Gay et al., 2009). In addition, according to Maruyama and Deno (1992), the time duration of any intervention is not a central issue because the study or research itself is much more complex than merely looking at the time duration. Therefore, the duration of any intervention may vary from study to study greatly, and it depends on the potential impact of the research on educational practice. Furthermore, to maximize the internal validity, the same trainer conducted the training for the two groups following an alternative schedule. Lastly, a post-test was administered to all the 172 representative samples.

Essentially, both the pre- and post-tests were identical but different in wording or layout as advised by Creswell and Creswell (2018). The tests comprised 30 MCQ items covering seven dimensions, namely phonics-related general knowledge (5 items), English sound system (3 items), phonics decoding rules (12 items), phonics instruction knowledge (3 items), knowledge and skills of phonemic awareness (5 items), sight words knowledge (1 item), and decoding rules reinforcement approach (1 item). Each of the MCQ items contained five answer options, including the option of 'no idea'. The reliability and validity of the tests were tested and verified. Both the

pre- and post-tests obtained an acceptable level of internal consistency reliability (McNamara, 2014) with the alpha value of 0.743 and 0.773, respectively, using Cronbach's alpha reliability method. In addition, for test item analysis, the index of item facilities and discrimination were measured and recorded at an acceptable level of 0.3 (FI) and 0.2 (DI) (Fraenkel et al., 2011; Wajihah et al., 2017). Besides, the difficulty level of the test items was also checked by four EFL educators who had more than 20 years of experience in teaching linguistics and pedagogy-related courses.

4. RESULTS

4.1 Homogeneity of Variance and Normality Test for the Pre-Test

The homogeneity of variance and the normality of the pre-test scores were first determined before the experiment on the research participants was conducted. This was premised on the need to decide if a parametric or a non-parametric test was more relevant for data analysis (Johnson & Christensen, 2019).

Table 1. Homogeneity of variance for the pre-test.

Levene Statistic	df1	df2	sig
0.583	3	168	0.627

Table 2. Homogeneity of variance in the pre-test for both groups.

Groups	Levene Statistic	df1	df2	sig
Experimental	0.788	3	82	0.504
Control	0.324	3	82	0.808

Analysis of the pre-test for the experimental and control groups showed that the assumption for homogeneity of variance was met. In addition, based on the overall test scores of both groups in the pre-test, the homogeneity of variance was assumed, too. So, the means between and within groups could be compared.

Table 3. Normality test of the pre-test for the control and experimental groups.

Groups	Kolmogorov-Smirnov			Shapiro--Wilk		
	statistic	df	sig	statistic	df	sig
Control	0.97	86	0.044	0.983	86	0.196
Experimental	0.90	86	0.084	0.983	86	0.304

Table 3 shows that the scores of both the experimental group and control group in the pre-test were well distributed. Under the premise that their homogeneity of variance was assumed and the scores were well distributed, an independent t-test was applied to measure the mean difference between the two groups in order to examine if the two groups were equivalent.

4.2 The Pre-Test Results

The descriptive analysis of the pre-test in Table 4 indicated that the means and SDs of the control group and experimental group were close to each other. Based on

the assumed homogeneity of variance and normal distribution, an independent t-test was applied to do the hypothesis testing. The results are shown in Table 5.

Table 4. Descriptive analysis of the pre-test.

	Control group (N=86)	Experimental group (N=86)
mean	12.279	12.105
SD	4.6619	4.5865

Table 5. Independent t-test results between the two groups in the pre-test.

Mean of the experimental group	Mean of the control group	Mean difference	t	df	sig (2-tailed)
12.279 (40.9%)	12.105 (40.04%)	0.174	2.47	170	0.805

The results in Table 5 were based on the null hypothesis: $H_0: \bar{X}_{x1} = \bar{X}_{c1}$ (x= experimental group, c=control group, 1=pre-test). The t-test results showed that $p=0.805 > 0.05$ which implied that the null hypothesis failed to be rejected. Hence, statistically, the experimental group and control group yielded no difference in the pre-test scores. This further indicated that the two groups were equivalent.

Furthermore, the equivalence of the two groups in the seven dimensions of the test was examined (Table 6). This analysis was crucial to lay a foundation for further analysis to determine the effectiveness of the intervention on each of the dimensions.

Table 6. Independent t-test results of the seven dimensions in the pre-test between two groups.

Dimensions	Mean of the experimental group	Mean of the control group	Mean difference	t	df	sig. (2-tailed)
General knowledge	1.593 (32%)	2.105 (42%)	-0.5117	-2.668	170	0.008*
Sound system	1.791 (59%)	1.884 (62%)	-0.093	-0.873	170	0.384
Decoding rules	4.198 (35%)	3.965 (33%)	0.2326	0.606	170	0.545
Phonics instruction	1.035 (34%)	0.930 (31%)	0.1047	0.623	170	0.534
Phonemic awareness	2.977 (60%)	2.616 (52%)	0.3604	1.585	170	0.115
Sight words	0.419 (42%)	0.349 (35%)	0.0698	0.938	170	0.35
Rules reinforcement	0.267 (27%)	0.256 (26%)	0.0116	1.72	170	0.863

(*Note: p-value is less than 0.05)

The findings presented in Table 6 were based on the null hypothesis: $H_0: \bar{X}_{nx} = \bar{X}_{nc}$ (n = any dimension, x= experimental group, c= control group). The findings revealed that between the experimental group and control group, there was no statistically significant difference in the participants' performance in each dimension ($p > 0.05$), except for phonics general knowledge (dimension 1, $p=0.008, < 0.05$). However, it is important to point out here that the mean difference in this dimension did not affect the overall mean of the full test between the two groups. In other words, though the mean of the experimental group was higher than the control group in the pre-test, if the situation was reversed after the treatment, that would explain the effects of the instructional guide.

4.3 Comparing Mean Scores of the Pre- and Post-Tests within the Experimental Group

The mean scores obtained by the experimental group participants in the pre- and post-tests were compared (see Table 7) to measure the effectiveness of PHOInG on their knowledge base to teach phonics after the intervention.

Table 7. Paired samples t-test results of the experimental group between the pre- and post-tests.

Mean of post-test	Mean of pre-test	Mean difference	SD	t	df	sig (2-tailed)
19.012 (63%)	12.395 (41%)	6.617	5.2360	11.718	85	0.000

The results in Table 7 were based on the null hypothesis: $H_0: \bar{X}_{x1} = \bar{X}_{x2}$. (x= experimental group, 1= pre-test, 2= post-test). The results showed that, for the experimental group, the mean difference between the post- and pre-test was 6.617 ($p < 0.05$), which indicated that the null hypothesis was rejected and there was a statistically significant difference in the participants' post- and pre-test scores after the intervention. This showed that the experimental group participants had made some progress after undergoing the training using PHOInG, and their improvement rate was approximately 22%.

For a more detailed analysis of the effectiveness of PHOInG on the pre-service EFL teachers' knowledge base in teaching phonics, the intervention effects on the seven dimensions of the test were examined by comparing the mean difference of the pre- and post-tests using paired samples t-test.

Table 8. Paired samples t-test results of seven dimensions between the pre- and post-test within the experimental group.

Dimensions	Mean of post-test	Mean of pre-test	Mean difference	SD	t	df	sig. (2-tailed)
General knowledge	2.984 (60%)	1.631 (37%)	1.37209	0.19151	7.165	85	0.000
Sound system	1.8953 (63%)	1.8023 (60%)	0.09302	1.02473	0.842	85	0.402*
Decoding rules	8.1163 (67%)	4.2326 (33%)	3.88372	0.32568	11.88	85	0.000
Phonics instruction	1.7674 (58%)	1.0698 (31%)	0.69767	1.46384	4.420	85	0.000
Phonemic awareness	2.8721 (56%)	2.9767 (57.4%)	0.10465	1.52647	0.636	85	0.527*
Sight words	0.6977 (70%)	0.4186 (42%)	0.27907	0.64445	4.016	85	0.000
Rules reinforcement	0.6774 (68%)	0.2791 (28%)	0.39535	0.57964	6.325	85	0.000

(*Note: The p-value is more than 0.05)

The results reported in Table 8 were based on the null hypothesis: $H_0: \bar{X}_{nx1} = \bar{X}_{nx2}$ (n = any dimension, x= experimental group, 1=pre-test, 2=post-test). As shown in Table 8, after the experiment, for five dimensions of the test, namely general knowledge, decoding rules, phonics instructions, sight words, and rules reinforcement, the significant value of the mean difference between the post- and pre-test was $p \leq 0.001$, indicating that the null hypothesis was rejected and significant differences

were recorded in the pre- and post-tests mean scores. The trainees made progress by 23%, 34%, 27%, 28% and 40%, respectively.

Nonetheless, for the dimensions of the sound system and phonemic awareness, the $p > 0.05$ implied that the null hypothesis failed to be rejected and there were no significant differences found between the means obtained from the pre- and post-tests. This implied that the trainees' learning progress in these two dimensions was not significant after the intervention.

4.4 Comparing Mean Scores of the Pre- and Post-Tests in the Control Group

In this section, the means of both pre- and post-tests within the control group were probed to examine whether the participants in the control group had made any progress in learning phonics and phonics instruction by using the conventional textbooks prescribed to them. Before the comparative analysis was conducted, homogeneity of variance and score distribution was checked to decide the method of carrying out hypothesis testing (Tables 9 and 10). As the score difference of the control group in both tests was not well distributed, therefore, Wilcoxon Test was deemed appropriate for hypothesis testing (Table 11).

Table 9. Homogeneity of variance for the post-test of the control group.

Levene Statistic	df1	df2	sig
0.69	3	82	0.976

Table 10. Normality of score difference of the control group in both tests.

	Kolmogorov-Smirnova			Shapiro--Wilk		
	statistic	df	Sig	statistic	df	sig
Control group - difference	0.313	86	0.000	0.825	86	0.000

Table 11. Wilcoxon test results within the control group between the pre- and post-tests.

Mean of post-test	Mean of pre-test	Mean difference	Z	sig (2-tailed)
11.837(39%)	12.105 (40%)	-0.268	-2.006	0.045*

(*note: The p-value is less than 0.05)

The results presented in Table 11 were based on the null hypothesis: $H_0: \bar{X}_{c1} = \bar{X}_{c2}$ (c=control group, 1=pre-test, 2=post-test). As shown in Table 11, the overall mean score of the post-test was lower by 0.268 as compared to the pre-test score with $Z = -2.006$, $p < 0.05$. This indicated that although the null hypothesis was rejected and there was a statistical difference between the two tests within the control group, the textbook approach did not help the participants in learning phonics and phonics instruction as they did not make much progress in learning.

The results in Table 12 were based on the null hypothesis: $H_0: \bar{X}_{nc1} = \bar{X}_{nc2}$ (n = any dimension, c= control group, 1=pre-test, 2=post-test). From Table 12, there was a statistically significant difference in the pre- and post-tests mean scores for the dimensions of the sound system and phonemic awareness ($Z = -2.121, -3.176$, and $p < 0.05$). However, despite the null hypothesis being rejected, showing the significant difference, the post-test scores were lower than the pre-test scores, which indicated that the textbook approach did not help the participants in learning the sound system and increasing their phonemic awareness. For the remaining five dimensions, there

was no statistical difference between the means of pre- and post-tests within the control group.

Table 12. Wilcoxon test results in each dimension between the pre-and post-tests within the control group.

Dimensions	Mean of post-test	Mean of pre-test	Mean difference	Z	sig. (2-tailed)
General knowledge	2.058 (41%)	2.105 (42%)	0.0466	-1.155	0.248
Sound system	1.814 (60.4%)	1.884 (62%)	0.0697	-2.121	0.034*
Decoding rules	3.942 (32.8%)	3.965 (31%)	0.0232	-0.040	0.968
Phonics instruction	0.965 (32%)	0.930 (31%)	-0.03488	-1.732	0.083
Phonemic awareness	2.430 (48.6%)	2.616 (52.2%)	0.18605	-3.176	0.001*
Sight words	0.337 (34%)	0.349 (35%)	0.01163	-1.000	0.317
Rules reinforcement	0.291 (30%)	0.256 (26%)	-0.03488	-1.732	0.083

4.5 Comparing Post-Test Scores between the Experimental and Control Groups

To compare the post-test mean scores of the two groups, the homogeneity and score distributions in the post-tests were first determined to decide whether to apply an independent t-test or Mann-Whitney U test. Analyses showed that for individual groups and both groups, the homogeneity of variance was met. However, for skewed score distribution, Mann-Whitney U Test could be applied for hypothesis testing.

Table 13. Homogeneity of variance for the post-test.

Group	Levene Statistic	df1	df2	sig
Control	0.69	3	82	0.976
Experimental	1.360	3	82	0.261

Table 14. Homogeneity of variance for the post-test of both groups.

Levene Statistic	df1	df2	sig
0.402	3	168	0.752

Table 15. Test of normality for the control and experimental groups in the post-test.

Groups	Kolmogorov-Smirnova			Shapiro--Wilk		
	statistic	df	sig	statistic	df	sig
Control	0.95	86	0.052	0.979	86	0.175
Experimental	0.132	86	0.001	0.954	86	0.004

Table 16. Test of normality for both groups in the post-test.

	Kolmogorov-Smirnova			Shapiro--Wilk		
	statistic	df	sig	statistic	df	sig
Control group in post-test	0.107	172	0.000	0.977	172	0.007

Table 17. Mann-Whitney U Test results between the two groups in the post-test.

Mean of the experimental group	Mean of the control group	Mean difference	Z	sig. (2-tailed)
19.012 (63%)	11.837 (39%)	7.1744	-7.366	0.000

The results in Table 17 were based on the null hypothesis: $H_0: \bar{X}_x = \bar{X}_c$ (x=experimental group, c=control group, 2=post-test). The Mann-Whitney U Test showed that $Z=-7.366$, $p<0.001$, indicating that the null hypothesis was rejected. This means that, overall, the trainees in the experimental group obtained a correct rate of 63% after undergoing the intervention using PHOInG. On the other hand, the control group participants' correct rate was only 39%. This also marked a significant difference in the post-test scores between these two groups.

Table 18. Mann-Whitney U Test results of each item in the seven dimensions between two groups in the post-test.

Dimensions	Items	Mean of the experimental group	Mean of the control group	Mean difference	Z	sig. (2-tailed)
General knowledge	total	2.9884 (60%)	2.0581 (41%)	0.9303	-3.937	0.000
	S1-1:phonics definition	0.616	0.349	0.267	-3.499	0.000
	S1-2: consonant blend	0.663	0.314	0.349	-4.536	0.000
	S1-3:consonant digraph	0.512	0.407	0.105	-1.373	0.170*
	S1-4:diphthong	0.512	0.407	0.105	-1.373	0.170*
	S1-5:phoneme definition	0.686	0.581	0.105	-1.420	0.156*
Sound system	total	1.8953 (63%)	1.8140 (60%)	0.0813	-1.130	0.258*
	S2-1: open syllable	0.640	0.581	0.059	-0.780	0.436*
	S2-2: final stable syllable	0.640	0.628	0.012	-0.158	0.875*
	S2-3: closed syllable	0.616	0.605	0.011	-0.156	0.876*
Decoding rules	total	8.1163 (68%)	3.9419 (32%)	4.1744	-8.417	0.000
	S3-1:silent consonant	0.709	0.291	0.418	-5.747	0.000
	S3-2:r-controlled vowel	0.709	0.326	0.383	-5.021	0.000
	S3-3:hard C	0.628	0.337	0.291	-3.804	0.000
	S3-4:soft C	0.674	0.314	0.360	-4.714	0.000
	S3-5:hard G	0.698	0.349	0.349	-4.567	0.000

Table 18 continued...

Decoding rules	S3-6:CVCe pattern	0.709	0.302	0.407	-5.322	0.000
	S3-7: silent E	0.500	0.326	0.174	-2.316	0.021
	S3-8: soft G	0.721	0.209	0.512	-0.6707	0.000
	S3-9: short vowel sound	0.721	0.326	0.395	-5.175	0.000
	S3-10: long vowel sound	0.674	0.535	0.139	-1.866	0.062*
	S3-11: silent letter	0.686	0.291	0.395	-5.171	0.000
	S3-12:variant hard C	0.686	0.337	0.349	-4.563	0.000
Phonics instruction	total	1.7674 (59%)	0.9651 (32%)	0.8023	-5.184	0.000
	S4-1:analytic phonics instruction	0.628	0.302		-4.268	0.000
	S4-2:synthetic phonics instruction	0.640	0.302	0.326	-4.417	0.000
	S4-3 Analogy phonics instruction	0.500	0.360	0.14	-1.843	0.0605
Phonemic awareness	total	2.8721 (57%)	2.4302 (48%)	0.4419	-1.448	0.148*
	S5-1:deletion	0.698	0.605	0.093	-1.1276	0.202*
	S5-2:blending	0.709	0.605	0.104	-1.441	0.149*
	S5-3:speech sound counting	0.384	0.302	0.082	-1.121	0.262*
	S5-4: alliteration	0.721	0.580	0.141	-1.914	0.056
	S5-5 phonemic awareness definition	0.360	0.337	0.023	-0.319	0.750*
Sight words	S6-1 sight words instruction	0.6977 (70%)	0.3372 (33%)	0.3605	-4.717	0.000
Rules reinforcement	S7-1 rules maintenance methods	0.6774 (68%)	0.2907 (29%)	0.3867	-5.021	0.000

(*Note: The p-value is more than 0.05)

The results in Table 18 were based on the null hypothesis: $H_0: \bar{X}_{nx2} = \bar{X}_{nc2}$ (n = any dimension, c = control group, x = experimental group, 2 = post-test). The findings presented in Table 18 showed that the correct rate for the sound system (dimension 2) and phonemic awareness (dimension 5) were similar for both the experimental and

control groups. For the former, the correct rate was 63% and 60% respectively; and for the latter, the correct rate was 57% and 44% respectively, with no significant difference ($p>0.05$). So, the null hypothesis failed to be rejected.

For the remaining five dimensions, the mean scores recorded in the experimental group were greater than the control group with $p<0.001$, which clearly indicated that the null hypothesis was rejected. The results further showed a statistically significant difference between the two groups in the five dimensions of the post-test. In short, the trainees in the experimental group outperformed their counterparts in the control groups in the five dimensions of the test, namely general knowledge, decoding rules, phonics instruction, sight words, and rules reinforcement.

Furthermore, for the general knowledge dimension, the trainees in the experimental group did not outperform their counterparts in the control group in the knowledge of consonant digraph, diphthong, and phoneme definition. Also, the trainees in the experimental group did not outperform the participants in the control group for the knowledge of the 'long vowel' sound.

To conclude, as [Kumar \(2019\)](#) noted, the objective of employing such an experimental design allowed for the examination of the causality between the independent variable (the guide) and the dependent variable (learning outcome) because the use of the control group was to quantify the extraneous variable's impact to ascertain the effect of the guide. In this regard, using the instructional guide in training had helped the pre-service EFL teachers to improve their overall knowledge base to teach phonics by 23%. More specifically, 24% of improvement was recorded for their general knowledge section, 35.6% for knowledge of decoding rules, 26% for knowledge of phonics instruction, 31.6% for sight words instruction, and as high as 36% for improvement for knowledge of decoding rules reinforcement. Therefore, it can be concluded that the main null hypothesis was rejected and the alternative hypothesis was accepted in which there was a positive causality between the instructional guide and the trainees' learning outcomes.

5. DISCUSSION

Fundamentally, the purpose of this study was to evaluate the effectiveness of the newly developed instructional guide (PHOInG) in improving the Chinese pre-service EFL teachers' knowledge base, or more precisely the subject matter content knowledge to implement systematic synthetic phonics instruction.

The findings revealed that for the experimental group, the participants' overall knowledge base had improved by 23% after the intervention. This could be attributed to the incorporation of the S-R theory with reinforcement in developing the PHOInG. Here, the newly developed instructional guide served as a form of reinforcement, covering the input, stimuli, or a more knowledgeable source, which had the function of changing learners' learning behaviour in order to achieve and attain the desired output or changes ([Reynolds, 2018](#)). In line with this, through the implementation of the instructional guide, the participants' subject matter knowledge in phonics and phonics instruction had improved. This also indicated that, as theorised in the Behaviouristic theories, the newly constructed information flowed from a knowledgeable source to less informed ones, and the results could be objectively measured by the participants' performance in the tests ([Robinson, 2018](#)).

From a micro perspective, the main findings of this study were, to a certain extent, similar to what [McCoy \(2017\)](#) reported in his research on instructional training. Comparatively, in his study, the twenty-one trainees' 'knowledge base' for phonics instruction had improved by 10.3%; while in the present study, the pre-service EFL teachers in the experimental group had recorded a 23% of improvement. The findings from these two studies reflected the educational implication of S-R Theory with reinforcement in which 'reinforcement' was a key determinant used to drive learning behaviour change ([Reynolds, 2018](#)). It is important to point out at this juncture that although different researchers hold different conceptualizations of the knowledge base for phonics instructions, their focus of analysis is somewhat similar. For instance, the 'phonics block' in [McCoy's \(2017\)](#) study included phoneme definition, syllables, diphthongs, digraphs, and decoding rules, which were classified as phonics knowledge to phonics education. This classification of the phonics knowledge base is similar to the proposed knowledge base or subject matter knowledge in the present study, which comprises the main contents of phonics general knowledge such as introduction to phonemes, syllables, and diphthongs and digraph, phonics decoding rules, and instructional approaches.

Despite the difference in conceptualizing knowledge base for phonics instruction, 'phonics decoding rules' remain one of the core knowledge areas in this area. In [Spear-Swerling et al. \(2005\)](#), [Brady et al. \(2009\)](#), [Ghoneim and Elghotmy \(2015\)](#), as well as [Westerveld and Barton's \(2017\)](#) studies, they unanimously indicated that through professional training in phonics instruction, their trainees' knowledge on phonics decoding rules had improved, with a range of 11.6% to 67%. In the present study, the participants had improved by 35.6% in this dimension. The available evidence seems to suggest that although the contents of the instructional guide can be tailored, adapted, or shortened for the training needs of different target groups, this dimension is deemed the most essential one and cannot be removed or shortened. This is because phonics instruction could not be realized without the knowledge of phonics decoding rules. This is also confirmed in [Yan \(2018\)](#), [Long \(2019\)](#), [Zhao \(2019\)](#), and [Zhong's \(2020\)](#) studies in which their respondents, including both in-service and novice teachers, expressed a strong desire to learn explicit and systematic phonics decoding rules. In that sense, the findings of this study reflected that the pre-service EFL teachers' needs to learn phonics decoding rules were met by the implementation of PHOInG.

Learning the phonics instruction approach is another core dimension of knowledge covered in PHOInG. After the intervention, the trainees' knowledge in this regard had improved by 26%. As for [McCoy's \(2017\)](#) study, phonics instruction approaches were combined with decoding rules, and overall his trainees improved by 10.3%. It is important to note that [McCoy's \(2017\)](#) study was carried out in an L1 context, thus, the inclusion of phonics instruction in the instructional guide proposed in the present study could fill the gap between teaching and learning English phonics and phonics instruction in the L2 context, specifically in the Chinese setting. To date, research in this domain is still scarce, and many EFL teachers in China are eager to learn how to teach phonics ([Yan, 2018](#); [Zhao, 2019](#); [Zhong, 2020](#); [Zhong & Kang, 2021](#)). Therefore, both the phonics instruction approach and the aforementioned phonics decoding rules are the critical knowledge base that needs to be considered in any intervention of this kind.

In terms of phonics general knowledge, which is operationalised as the basic terms related to phonics such as diphthongs, blends, clusters, and so on, is another equally important core knowledge that needs to be included in any intervention for learning phonics and phonics instruction. The basic knowledge of terms is very important for pre-service teachers to become competent in their future classroom teaching because those key terms can help them better understand phonics and phonics instructions (McCoy, 2017). This claim is also true for the current scenario of teaching phonics among Chinese EFL teachers.

Besides that, learning 'sight words' was another key element in PHOInG which witnessed a learning progress of 31.6% by the participants. As Blevins (2017), and Ghoneim and Elghotmy (2015) pointed out, sight word instruction mainly focuses on dealing with irregular words in English which takes up about 16% of English vocabulary. From a narrower perspective, 'sight words' include those high-frequency words as well as tricky words which do not follow common spelling patterns (Blevins, 2017). Phipps (2011) suggested that these tricky words should be taught along with synthetic phonics to help learners to achieve reading automaticity. In the same vein, Zhao (2019) found that many EFL teachers were actually eager to learn how to tackle tricky words in daily teaching. Due to this reason, the learning of sight words in any intervention for phonics instruction is necessary.

In light of the educational or pedagogical implication of the 'Law of Exercise' under the S-R Theory with reinforcement, practice is considered the key to the completeness of learning. This implies that the connection between stimuli and response is strengthened by practice or use (Islam, 2015). To enhance the learning of phonics among Chinese EFL students based on this principle, the present study recommends the use of decodable text in phonics instruction as part of the intervention. Via this tool, the pre-service EFL teachers would be able to learn how to use decodable text to help their future students to reinforce the already learned decoding rules. In a training program designed for pre-service teachers by Manchester Metropolitan University (2015), this knowledge was also incorporated into their training framework. Also, Blevins (2017) found that when teachers used decodable text in teaching English phonics, their students would be more confident in reading books at a comparatively more difficult level. Thus, incorporating decodable text along with phonics instruction is essential for training.

On the other hand, in this study, the participants did not make any significant progress in the dimension of phonemic awareness. This finding was contrary to those reported in Spear-Swerling et al. (2005), Brady et al. (2009), Ghoneim and Elghotmy (2015), McCoy (2017), and Westerveld and Barton's (2017) studies. The plausible reasons for this scenario are multi-dimensional. Firstly, since both explicit and systematic synthetic phonics instruction and 'phonics instruction' were assumed to foster phonemic awareness at the same time (Blevins, 2017; International Literacy Association, 2018), phonemic awareness 'contents' were not the training focus of the proposed instructional guide. In PHOInG, only definitions, significance, as well as phonemic awareness skills were introduced because it was not identified as the prioritised needs for learning phonics and phonics instruction by the pre-service EFL teachers in the preliminary study. Secondly, knowledge in this section was not part of their prioritized needs. Thus, it could be postulated that the trainees were not ready to learn the knowledge. Lastly, the trainees might have probably learned how to blend and segment words from their past learning based on their scores in the pre-test, thus,

there was no significant progress found in their phonemic awareness after the intervention. As Brady et al. (2009) pointed out when the higher the scores are the less space for improvement.

6. CONCLUSION

In conclusion, the main objective of this study was to evaluate to what extent a phonics instructional guide that had been developed following the ADDIE framework could equip Chinese pre-service EFL teachers with the necessary knowledge base to implement systematic and explicit phonics instruction in EFL classrooms. The results of the study indicated that the proposed Phonics Instructional Guide (PHOInG) was more effective in equipping Chinese pre-service EFL teachers with the knowledge to implement phonics instructions than the prescribed textbook used with the control group. As most of the studies on phonics instruction training were conducted in non-Chinese monolingual or bilingual ESL/EFL learning contexts, the present study contributes to enriching the literature in this domain in EFL settings in China.

Nonetheless, this study suggests further investigations into the dimensions of ‘sound system’ and ‘phonemic awareness’ as the trainees in the study did not show any significant improvement in the said dimensions after the intervention. This could be done by conducting a more comprehensive assessment of the Chinese pre-service EFL teachers’ needs to learn the knowledge related to these two dimensions. Based on the outcomes of the needs assessment, it is hoped that a more feasible and effective instructional guide could be devised for the use of phonics instruction training. In brief, this study provides ample support for the need for innovating phonology courses in EFL teachers’ preparation programmes in China.

REFERENCES

- Amadi, E. A. (2019). Bottom-up theory and phonics instruction: Implications for beginning reading. *European Journal of Applied Linguistics Studies*, 1(2), 89-100.
- Blevins, W. (2017). *Phonics from A to Z: A practical guide* (3rd ed.). Scholastic.
- Brady, S., Gillis, M., Smith, T., Lavalette, M., Liss-Bronstein, L., Lowe, E., North, W., Russo, E., & Wilder, T. D. (2009). First grade teachers’ knowledge of phonological awareness and code concepts: Examining gains from an intensive form of professional development and corresponding teacher attitudes. *Reading and Writing* 22(4), 425-455. <https://doi.org/10.1007/s11145-009-9166-x>
- Branch, R. M. (2018). Characteristics of foundational instructional design models. In A. R. Robert & V. D. John (Eds.), *Trends and issues in instructional design and technology* (4th ed., pp. 23-30). Pearson.
- Budiman, A. (2017). Behaviourism in foreign language teaching methodology. *English Franca*, 1(2), 101-114. <http://dx.doi.org/10.29240/ef.v1i2.171>
- Creswell, J. W., & Creswell, D. J. (2018). *Research design* (5th ed.). Sage Publications.

- El-Amin, A. (2020). Andragogy: A theory in practice in higher education. *Journal of Research in Higher Education*, 4(2), 54-69. <http://doi.org/10.24193/JRHE.2020.2.4>
- Fraenkel, J. R., Wallen, N. E., & Hyun, H. H. (2011). *How to design and evaluate research in education* (8th ed.). McGraw-Hill Companies Inc.
- Gagné, R. M., Wager, W. W., Golas, K. C., & Keller, J. M. (2005). *Principles of instructional design* (5th ed.). Thomson Learning.
- Gay, L. R., Mills, G. E., & Airasian, P. (2009). *Educational research: Competencies for analysis and applications* (9th ed.). Pearson Education.
- Ghoneim, N. M. M., & Elghotmy, H. E. A. (2015). The effect of suggested. Multisensory phonics program on developing kindergarten pre-service teachers' EFL reading accuracy and phonemic awareness. *English Language Teaching*, 8(12), 124-143. <http://dx.doi.org/10.5539/elt.v8n12p124>
- Gopal, R., & Mahmud, C. T. (2018). Miscue analysis: A glimpse into the reading process. *Studies in English Language and Education*, 5(1), 12-24. <http://doi.org/10.24815/siele.v5i1.9927>
- Gopal, R., & Singh, C. K. S. (2020). Arising reading patterns in understanding literary texts. *Studies in English Language and Education*, 7(2), 407-420. <https://doi.org/10.24815/siele.v7i2.16663>
- He, S. Q. (2018). *An empirical study of the impact of phonics on the reading and writing of English vocabulary in primary schools* [Master's thesis, Shanghai International Studies University]. China National Knowledge Infrastructure. <https://kns.cnki.net/KNS8/Detail?sfield=fn&QueryID=28&CurRec=1&DbCode=CMFD&dbname=CMFD201802&filename=1018231078.nh>
- International Literacy Association. (2018). *Explaining phonics instruction: An educator's guide*. <https://literacyworldwide.org/docs/default-source/where-we-stand/ila-explaining-phonics-instruction-an-educators-guide.pdf>
- International Literacy Association. (2019). *Meeting the challenges of early literacy phonics instruction*. <https://www.literacyworldwide.org/docs/default-source/where-we-stand/ila-meeting-challenges-early-literacy-phonics-instruction.pdf>
- Islam, M. H. (2015). Thorndike Theory and its application in learning. *At-Ta'lim: Jurnal Pendidikan*, 1(1), 37-47.
- Iswati, L., & Triastuti, A. (2021). Voicing the challenges of ESP teaching: Lessons from ESP in non-English departments. *Studies in English Language and Education*, 8(1), 276-293. <http://doi.org/10.24815/siele.v8i1.17301>
- Johnson, R. B., & Bendolph, A. (2018). Evaluation in instructional design: A comparison of the major evaluation models. In A. R. Robert & V. D. John (Eds.), *Trends and issues in instructional design and technology* (4th ed., pp. 87-96). Pearson.
- Johnson, R. B., & Christensen, L. (2019). *Educational research: Quantitative, qualitative and mixed approaches* (7th ed.). Sage Publications.
- Knowles, M. S., Holton III, E. F., Swanson, R. A., Robinson, P. A. (2015). *The adult learner: The definitive classic in adult education and human resource development* (8th ed.). Routledge.
- Kumar, R. (2019). *Research methodology: A step-by-step guide for beginners* (5th ed.). Sage Publications Ltd.

- Liu, G. C. (2019). *The effectiveness of phonics instruction in English vocabulary teaching at primary schools* [Master's thesis, Yunnan Normal University]. China National Knowledge Infrastructure. <https://kns.cnki.net/KNS8/Detail?sfield=fn&QueryID=44&CurRec=2&DbCode=CMFD&dbname=CMFD202001&filename=1019922974.nh>
- Long, Y. H. (2019). *On the current situation and countermeasures of applying phonics to English teaching of rural middle schools-Take Jiujiang Middle School of Shuangliu District in Chengdu for example* [Master's thesis, Sichuan Normal University]. China National Knowledge Infrastructure. <https://kns.cnki.net/KNS8/Detail?sfield=fn&QueryID=25&CurRec=6&DbCode=CMFD&dbname=CMFD202001&filename=1020015165.nh>
- Manchester Metropolitan University (2015). *PGCE phonics and early reading training and professional training*. Faculty of Education. <https://www.mmu.ac.uk/media/mmuacuk/content/documents/primary-teacher-education/partnership/2015-16/school-based-training-documents/pgce/Teaching-Phonics-PGCE.pdf>
- Maruyama, G., & Deno, S. (Eds.). (1992). *Research in educational settings*. SAGE Publications. <https://dx.doi.org/10.4135/9781412985680>
- McCoy, R. (2017). Phonics preparation in teacher education programs. *The Kabod*, 3(3), Article 7. <https://digitalcommons.liberty.edu/kabod/vol3/iss3/7>
- McNamara, T. (2014). *Language testing*. Oxford University Press.
- Ministry of Education. (2011). *English curriculum for compulsory education*. Beijing Normal University Publishing Group.
- Morrison, G. R., Ross, M. S., Morrison, R. J., & Kalman, H. K. (2019). *Designing effective instruction* (8th ed.). Wiley.
- Nafiah, U. (2020). Developing English modules with integrated Islamic values and Jambi local wisdom. *Studies in English Language and Education*, 7(1), 96-112. <http://doi.org/10.24815/siele.v7i1.15138>
- Nasir, C., Gani, S. A., & Haqqini, D. (2019). Group investigation technique for better reading comprehension skill. *Studies in English Language and Education*, 6(2), 251-261. <https://doi.org/10.24815/siele.v6i2.13619>
- Nation, I. S. P., & Macalister, J. (2010). *Language curriculum design*. Routledge.
- Nazir, F. B. (2018). Stimulus-response theory: a case study in the teaching and learning of Malay language among year 1 pupils. *The journal of Social Science Research*, 4(10), 153-157. <http://doi.org/10.32861/journal.7.2018.410.153.157>
- Phipps, B. (2011). *A study of phonics instruction: Teaching phonics dance to at-risk elementary students to improve decoding skills*. Centennial Library.
- Reynolds, J. E. (2018, March 17). Implication of learning theories on instructional design. *eLearning Industry*. <https://elearningindustry.com/learning-theories-instructional-design-implications>
- Robinson, J. M. (2018). Evaluation of teaching methods to improve reading performance of English language learners. *Advancement of Educational Research International*, 12(1), 25-33. <https://eric.ed.gov/?id=EJ1209451>
- Schunk, D. H. (2020). *Learning theories: An educational perspective* (8th ed.). Pearson.
- Spear-Swerling, L., Brucker, P. O., & Alfano, M. P. (2005). Teachers' literacy related knowledge and self-perceptions in relation to preparation and experience. *Annals of Dyslexia*, 55(2), 266-296. <https://doi.org/10.1007/s11881-005-0014-7>

- Surdyanto, A., & Kurniawan, W. (2020). Developing critical reading module using Integrated Learning Content and Language Approach. *Studies in English Language and Education*, 7(1), 154-169. <http://doi.org/10.24815/siele.v7i1.15098>
- Syamdianita, & Cahyono, B. Y. (2021). The EFL pre-service teachers' experiences and challenges in designing teaching materials using TPACK framework. *Studies in English Language and Education*, 8(2), 561-577. <http://doi.org/10.24815/siele.v8i2.19202>
- Tahir M. H. M., Shah, D. S. M., Shak, M. S. Y., Albakri, I. S. M. A., & Adnan, A. H. M. (2021). Explicit vocabulary instruction: Effects of vocabulary learning on Form Two ESL learners. *Studies in English Language and Education*, 8(3), 1227-1247. <http://doi.org/10.24815/siele.v8i3.19539>
- Wajiha, M., Alam, S., Hassan, U., Zafar, T., Butt, R., Konain, S., & Rizvi, M. (2017). Difficulty index, discrimination index and distractor efficiency in multiple choice questions. *Annals of PIMS*, 13(4), 310-315.
- Westerveld, M. F. & Barton, G. M. (2017). Enhancing phonological awareness and orthographic knowledge of preservice teachers: An intervention through online course work. *Australian Journal of Teacher Education*, 42(12), 98-111. <https://doi.org/10.14221/ajte.2017v42n12.6>
- Yan, Y. W. (2018). *A research on the problems and countermeasures of phonics in primary school English teaching* [Master's thesis, Liao Cheng University]. China National Knowledge Infrastructure. <https://kns.cnki.net/KNS8/Detail?sfield=fn&QueryID=14&CurRec=1&DbCode=CMFD&dbname=CMFD201802&filename=1018824601.nh>
- Zhang, Y. H. (2019). *An empirical study on the introduction of primary school students' English reading based on phonics* [Master's thesis, Shandong Normal University]. China National Knowledge Infrastructure. <https://kns.cnki.net/KNS8/Detail?sfield=fn&QueryID=14&CurRec=3&DbCode=CMFD&dbname=CMFD201902&filename=1019118764.nh>
- Zhao, Z. Y. (2019). *A Case study on primary school novice English teachers' beliefs and practice about phonics instruction* [Master's thesis, Sichuan Normal University]. China National Knowledge Infrastructure. <https://kns.cnki.net/KNS8/Detail?sfield=fn&QueryID=23&CurRec=1&DbCode=CMFD&dbname=CMFD202001&filename=1019096998.nh>
- Zhong, W. X. (2020). *A Study on the application of phonics in primary school English vocabulary teaching* [Master's thesis, Hunan Normal University]. China National Knowledge Infrastructure. <https://kns.cnki.net/KNS8/Detail?sfield=fn&QueryID=2&CurRec=1&DbCode=CMFD&dbname=CMFD201701&filename=1016085684.nh>
- Zhong, B. & Kang, Y. (2021). Chinese EFL teachers' perception and practice of phonics instruction. *Journal of Language Teaching and Research*, 12(6), 990-999. <http://doi.org/10.17507/jltr.1206.15>