

The Zone of Proximal Development in Pre-service Teacher Training: A Case Study on ZPTD in Lesson Plan Design

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Abstract

This study explores the application of Vygotsky's zone of proximal development in pre-service teacher training by investigating the effectiveness of ZPTD in lesson plan design. A qualitative research approach has been utilized to gather and analyze both versions of a lesson plan designed by a pre-service teacher (the researcher). The revised lesson plan, with appropriate scaffolding from the instructor and suitable advice from peers, is more balanced and better developed when compared to the original version that created by the pre-service teacher alone. In comparison to effects of microteaching, students show increased engagement and motivation in the modified lesson plan implementation, indicating that the pre-service teacher has reached the potential level in lesson plan design with the help of the instructor's scaffolding. By bridging the gap between the pre-service teacher's current and potential level of designing a lesson plan, this study shows that ZPTD can be applied in pre-service teacher training on lesson plan design.

Keywords: lesson plan, pre-service teacher training, zone of proximal development, zone of proximal teacher development

1. Introduction

The Zone of Proximal Development (ZPD) is defined as the discrepancy between what a child can do without help and what a child can reach with the assistance of teachers, parents and advanced peers (Vygotsky, 1978). Most research on ZPD primarily focuses on the potential development of children (Chaiklin, 2003; Margolis, 2020; Silalahi, 2019; Tharp & Gallimore, 1991; Tudge, 1992; Verenikina, 2003; Vygotsky, 1978, 1998, 2011; Wass & Golding, 2014; Wertsch, 1988, 1998). It was only in the year 2011 when Warford first introduced the theory of the zone of proximal teacher development (ZPTD) that researchers started to investigate how ZPD could also impact the growth of teachers (Fani & Ghaemi, 2011; Potgieter & van der Walt 2022; Warford, 2011, Waugh & Onditi, 2015). However, relevant literature gives more attention to the implementation of ZPD in teacher education, taking a broad perspective, while few have delved into the specific implications of ZPTD, like ZPTD in lesson plan design for pre-service teacher training.

This paper investigates the application of ZPTD in training pre-service teachers on lesson plan design. A lesson plan created by a pre-service teacher (the researcher) is showcased, featuring the original version developed by the pre-service teacher herself and a revised version based on feedback from her instructor as well as peers. A significant improvement of lesson plan design and micro-teaching effects have been displayed after the instructor's guidance and peers' advice.

2. Literature Review

2.1 Zone of Proximal Development (ZPD) and Scaffolding

Zone of Proximal Development, better known as ZPD, is the space between the acquisition children can achieve by themselves and the achievement children can obtain with the assistances of adults or more capable peers (Vygotsky, 1978). The word "proximal" signifies that the support offered by adults is slightly above the learner's current ability (Cole & Cole, 2001). Different people may have different levels of ZPD (Vygotsky, 1978). In order to help learners achieve their own ZPD, diverse biological nature and cultural backgrounds have to be taken into account (Verenikina, 2003).

Assistance provided by adults, such as teachers, parents or advanced peers within the ZPD could be referred to as scaffolding (Wood, Bruner, & Ross, 1976). Scaffolding is the process of a more competent individual, an expert, offering support to a less competent individual, a novice (Guerrero & Villamil, 2000). Effective scaffolding is strongly interlinked with zone of proximal development (Berk, 2002; Daniels, 2001; Krause, Bochner, Duchesne, & McMaugh, 2022; McDevitt, Ormrod, Cupit, Chandler, & Aloa, 2013; Ohta, 2000). Modelling, bridging, contextualising, repetition, examples, peer-mentoring and feedback are some well recognized techniques of scaffolding in education (Abdurrahman, Saregar, & Umam, 2018; Leidenfrost, Strassnig, Schabmann, Spiel, & Carbon, 2011; Walqui, 2006). Appropriate scaffolding provided by adults or advanced peers enables less competent individuals to accomplish tasks beyond their current levels (Guerrero & Villamil, 2000), and the effectiveness of assistance provided in the ZPD is maximized when it is tailored to the specific individual (Lantolf & Aljaafreh, 1996).

Differences in students' abilities, skills and context have resulted in extension and adaption of ZPD (Waugh & Onditi, 2015). The concept of ZPD can be applied not only between children and adults, but also among adults themselves (Fani & Ghaemi, 2011; Ohta, 2005; Tharp & Gallimore, 1991; Warford, 2011). Ohta (2005) proposes that zone of proximal development can be extended and applied to the development of second language adult learners. The extended definition specifies that ZPD is the gap between a person's current language level and the higher potential level that can be reached with the guidance of an instructor or peers, and adult peers do not have to be more skilled to offer help in the ZPD (Fani & Ghaemi, 2011).

2.2 Zone of Proximal Teacher Development (ZPTD)

Warford (2011) has proposed that ZPD can be applied in the education of teachers and can be reconceptualized as zone of proximal teacher development. Zone of proximal teacher development, commonly referred to as ZPTD, is the gap between what a teaching candidate can achieve independently without any assistance and what a pre-service teacher could reach with the guidance from more experienced individuals like instructors and supervisors (Fani & Ghaemi, 2011; Warford, 2011; Waugh & Onditi, 2015). Four phases of ZPTD are concluded as self-assistance, teacher-assistance, internalization (automatization) and recursion (de-automatization) (Fani & Ghaemi, 2011; Warford, 2011; Waugh & Onditi, 2015).

Initial phases of ZPTD include phase I (self-assistance) and phase II (teacher-assistance) (Fani & Ghaemi, 2011; Warford, 2011), which requires an inversion of the first two phases of ZPD (Vygotsky, 1986) due to the loss of flexibility of adult learners' neural networks as they mature (Warford, 2011). Teaching candidates' present level of development should be firstly assessed through self-reflection. According to their current level, a program then can be tailored to the corresponding teaching candidates by instructors or supervisors. Advanced phases of ZPTD include phase III of internalization and phase IV of recursion (Fani & Ghaemi, 2011; Warford, 2011). Apprenticeship of observation, videotaped micro-teaching exercises and context-based lesson delivery are commonly employed at these two phases.

3. Methods

3.1 Research Questions

This study provides two versions of a lesson plan designed by a pre-service teacher, one designed by the pre-service teacher herself and the other one revised after receiving the instructor's guidance and feedback. The effectiveness of two lesson plans is measured by grades given by the instructor, the feedback offered by peers, and the engagement of students during the micro-teaching exercises. This paper intends to investigate the application of ZPTD in pre-service teacher training on lesson plan design, with an emphasis on two questions:

- 1) Can the application of ZPTD improve pre-service teachers' lesson plan design?*
- 2) How can ZPTD be applied in pre-service teachers' lesson plan design?*

3.2 Participants

The researcher of this study is a pre-service English as a foreign language (EFL) teacher whose mother tongue is Chinese. She together with her instructor who is a native English speaker, and 3 peers (1 Canadian pre-service teacher, 2 Chinese pre-service teachers) acts as the subject in this research.

3.3 Data Collection

During the teacher training project in Canada, the pre-service EFL teacher was asked to prepare a teaching plan for twenty 12-14 years old EFL Chinese middle school students whose proficiency level is in between beginner and intermediate. The teaching plan should balance four strands, namely, meaning focused input, meaning focused output, language focused learning and fluency development (Webb & Nation, 2017). Students should be

able to proficiently use the simple past form of target verbs in speaking and writing by the end of the class.

After the completion of the original lesson plan, a micro-teaching exercise with the observation of the instructor and three peer pre-service teachers is then applied. The instructor grades the entire assignment and provides effective scaffolding (modelling and feedback) on the design of the lesson plan so as to improve the whole teaching process. Peer pre-service teachers' comments are also collected for the improvement. After the instructor's evaluation, self-reflection is conducted by the researcher, and the teaching plan is revised according to the review from the instructor and peers.

After the modification, the teaching plan is re-evaluated by the instructor, peers and the researcher herself. A micro-teaching exercise is then implemented to verify the validity of assistance (scaffolding) made by the instructor and peers.

3.4 Data Analysis

Qualitative method has been applied to the current research. The main instrument in this study is the written version of an original lesson plan (the pre-service teacher designed independently) and a revised one (the pre-service teacher designed with the assistance of the instructor and peers). Two lesson plans are evaluated by the instructor, and compared through the implementation of micro-teaching exercises from the aspects of warmer, presentation, practice, production and review according to the theory of a well-designed teaching program written by Webb and Nation (2017).

4. Results

The assistance obtained in the interaction with experts or peers can be referred to as scaffolding for learners to improve their cognitive levels and skills (Maybin, Mercer, & Stierer, 1992). Feedback from the instructor as well as comments from peers can be treated as scaffolding in the process of lesson plan design. More specifically, three scaffolding techniques have been employed in this program: modelling, providing feedback and peer-monitoring. After scaffolding, the instructor gives an overall score of both the original and revised version of the lesson plan from five perspectives: warmer, presentation, practice, production and review. The result shows that the overall grade of the revised lesson plan has been improved from 80 to 98 on a scale of one hundred (See the following Table 1). Based on the instructor's evaluation scores and subsequent classroom observation, the modified lesson plan becomes more professional than the initial one. The comparison of the two teaching plans (the original one and the revised one) is presented as follows:

Table 1. Grades given by the instructor on the two lesson plans

Category	The Original Version	The Revised Version
Overall Grade	80/100	98/100
Warmer	×	√
Presentation	√	√
Practice	×	√
Production	×	√
Review	×	√

Note: "×" means "to be revised", "√" means "up to the requirement".

4.1 Warmer

In the original lesson plan, new grammar knowledge is directly introduced at the beginning of the class. Based on students' performance and the instructor's feedback, learners are not prepared to assimilate new knowledge, resulting in lower learning efficiency throughout the whole educational process.

The scaffolding technique of modelling has been employed in this section. Following the instructor's demonstration of a range of warm up activities, such as flashcards, question scramble and hot potato, the pre-service teacher adds a warm-up activity, flashcards, to the revised lesson plan (as presented in the Table 2), which attracts students' attention and enhances students' engagement in the following learning process.

Table 2. The comparison of the warmer between the original and revised lesson plan

Stage	The original lesson plan	The revised lesson plan
Warmer	None	Flashcards: Use flashcards to review the simple past tense of 5 words learnt from the previous class (the whole class pronounces and spells the simple past form of 5 vocabularies together).

4.2 Presentation

There haven't been many changes in the presentation section between the original lesson plan and the revised lesson plan as in the following Table 3.

Table 3. The comparison of the *presentation* between the original and revised lesson plan

Stage	The original lesson plan	The revised lesson plan
Presentation	The teacher briefly mentions the grammar rule of simple past tense which has been taught from the previous class (directly add “-ed”; add “-d” to verbs ending with “-e”; change “y” into “i” and add “-ed” to verbs ending with “-y”). Then the teacher illustrates the simple past tense of 5 new target verbs (play, cook, close, wipe and study).	The teacher briefly mentions the grammar rule of simple past tense which has been taught from the previous class (directly add “-ed”; add “-d” to verbs ending with “-e”; change “y” into “i” and add “-ed” to verbs ending with “-y”). Then the teacher illustrates the simple past tense of 5 new target verbs (play, cook, close, wipe and study).

4.3 Practice

Presented in the Table 4 is the comparison of the “practice” section in the two versions of the lesson plan. In the practice segment of the original lesson plan, students are given a cloze test, and they have to fill in blanks with the simple past tense of the target verbs right after the teacher's presentation.

The scaffolding technique of feedback has been utilized in this part. According to oral feedback from the instructor and peers, students who are new to the language point may find it challenging to fill in blanks, because they are not yet skilled in pronunciation, spelling and utilization of the target grammar point. Hence, it would be beneficial to include a simpler assignment to assist students in becoming more comfortable with the knowledge they have just learned. In the revised lesson plan, the “repeat after me” activity is scheduled before the task “cloze” to help students better absorb the target knowledge as well as serve as a medium to bridge the gap between learners' input and output skills.

Table 4. The comparison of the *practice* between the original and revised lesson plan

Stage	The original lesson plan	The revised lesson plan
Practice	Cloze: Use the simple past form of target words to fill in blanks	Repeat after me: Students repeat after the teacher by pronouncing and spelling the simple past tense of target words. Cloze: Use the simple past form of target words to fill in blanks

4.4 Production

Table 5 displays the teaching modules of the “production” before and after the revision based on the instructor's scaffolding. According to the comments from the instructor, the original lesson plan which requires students to write an article by using the simple past tense of target verbs is deemed over-challenging for students who are not proficient enough in this grammar point, potentially causing students to feel reluctant to write.

The scaffolding technique of modelling has been applied in this section. Some less challenging productive tasks, such as describing a picture, writing a short story, and role-play, have been exemplified by the instructor. The lesson plan has then been revised to have learners orally describe 5 pictures in 5 sentences by using the simple past tense of target verbs, which is more manageable for them. Also, speed writing has been arranged as the second activity. Students have to write down the 5 sentences that they have produced before. All of the students are well engaged, and their assignments are collected as well as graded by the pre-service teacher after writing.

Table 5. The comparison of the *production* between the original and revised lesson plan

Stage	The original lesson plan	The revised lesson plan
Production	Writing: Write an article by using the simple past form of target verbs (the article should be no less than 10 sentences)	Describing 5 pictures: Use the simple past tense of one of target verbs to describe each picture in one sentence. (speaking skill) Speed writing: Write down the 5 sentences that have been produced just now. (writing skill)

4.5 Review

The scaffolding technique of peer-monitoring can be seen in this part. The initial lesson plan does not include any review activities. Based on peer guidance and feedback, adding a brief review to the course design can be conducive to students' proficiency and mastery of target information. Hence, a quick "pronouncing and spelling" review activity has been added to the revised lesson plan (See the Table 6) to assist students in strengthening their memory of the simple past tense of target verbs.

Table 6. The comparison of the *review* between the original and revised lesson plan

Stage	The original lesson plan	The revised lesson plan
Review	None	Pronouncing and spelling: Students pronounce and spell the simple past tense of five target verbs with the teacher together.

5. Discussion

The finding shows that the application of ZPTD in lesson plan design for pre-service teacher training is effective and can be employed through scaffolding. Three scaffolding techniques, modelling, feedback and peer-monitoring, have been employed in this study. In modelling, it is important to provide explicit examples that set specific guidelines, so learners can easily grasp standards and accomplish similar tasks (Walqui, 2006). Feedback can be treated as soft scaffolding in education (Abdurrahman et al., 2018). The procedure of peer monitoring has a positive impact on the academic achievement of those being mentored (Leidenfrost et al., 2011).

Based on effective scaffolding techniques mentioned above, the pre-service teacher has successfully modified the original lesson plan into a better-developed one, indicating that ZPTD has been successfully applied in the training of the pre-service teacher on lesson plan design. The pre-service teacher's teaching skill has also been enhanced significantly through the implementation of the revised lesson plan. In the after-training teaching career, her teaching procedure is positively impacted by the modified lesson plan. The following part provides a detailed analysis on five sections (warmer, presentation, practice, production, and review) of the updated lesson plan.

Webb and Nation (2017) state that a well-designed teaching program should balance four strands: meaning focused input, meaning focused output, language focused learning and fluency development. The original lesson plan includes strands of meaning focused input, meaning focused output and language focused learning but lacks the strand of fluency development. Following the guidance from the instructor and the advice from peers, four strands have been effectively integrated in the revised lesson plan (as can be seen in the following passage).

Based on the instructor's modelling, the revised lesson plan includes a warm up activity, flashcards, which is not shown in the original one. Warm up activities are often used to activate a class, and students' engagement as well as motivation will be boosted through Warmers. Flashcards can be treated as a typical warm up activity and can be utilized to improve students' learning (Senzaki, Hackathorn, Appleby, & Gurung, 2017). The activity "flashcards" mainly relates to the strand of language-focused learning, which can reinforce students' memory retention of new vocabularies (Webb & Nation, 2017). Hence, the simple past tense of 5 words learnt in the previous class are reviewed and strengthened in the beginning of the lesson.

No alternations have been made to the presentation part, which mainly addresses to the strand of meaning focused input. In this part, the pre-service teacher firstly reviews the grammar rules of simple past tense, and then illustrates language points of the simple past tense of five target verbs in detail. Meaning-focused input is a critical aspect in designing a successful teaching program (Webb & Nation, 2017); and learning through meaning-focused input provides chances for incidental acquisition of language (Nguyen, 2024; Webb, 2016). Therefore, students can have a basic understanding of the simple past tense of 5 target verbs after the teacher's presentation.

The original lesson plan only includes one exercise, cloze, in practice part. Students have to use the simple past form of target verbs to fill in blanks. Feedback and advice from the instructor and peers indicate that inexperienced language learners may struggle with this assignment as they are not proficient in pronunciation, spelling and application of the target grammar point. The revised practice part adds "repeat after me" before "cloze". Repetitive learning is significant in second language acquisition (e.g. Duff, 2000; Kweon & Kim, 2008). Target words can be better grasped after numerous repetitions and encounters in a short time (Webb & Nation, 2017). Cloze can be used as an activity for testing (Oller & Jonz, 1994; Hughes & Hughes, 2020), so students' mastery of the simple past tense of target verbs can be examined through this exercise.

The production section mainly concentrates on the strand of meaning focused output. Only a writing assignment is included in the original lesson plan. Students have to write an article by utilizing the simple past form of target verbs, with a minimum of 10 sentences required. According to the feedback from both the instructor and students, the writing assignment is overly challenging for learners who are new to the grammar point, potentially reducing students' motivation and confidence. Following the instructor's illustration of some less challenging productive tasks, pictures (multimodal text) enclosing speaking and speed writing activities have been employed in the revised lesson plan. Students need to utilize the simple past tense of target words to describe five pictures in five sentences, and then write down the sentences that they have constructed. Smith (2014) indicates that multimodal text and writing activities can increase learners' motivation as well as create scaffolding for learners. Motivation plays a crucial role in second language acquisition (Dörnyei & Csizér, 1998; Dörnyei & Ushioda, 2021; Seven, 2020).

The activity "describing 5 pictures" practices students' speaking skill while "speed writing" develops students' writing skill as well as focuses on students' fluency development. Webb and Nation (2017) suggest that repeatedly practicing mastered knowledge and making full use of existing information in a limited time can serve as a method to develop fluency in language acquisition. In the whole process of production part, students practice the simple past tense of target verbs twice in a short time. Repetitive learning has a remarkable influence on students' vocabulary acquisition (Chen & Truscott, 2010; Webb, 2007).

Review has been added to the revised lesson plan after a peer-monitoring procedure. Nation (2008) states that reviewing plays a significant role in second language acquisition. In this lesson plan, the "pronouncing and spelling" activity allows students to have a better mastery of the simple past tense of target verbs.

6. Conclusion

This study explores the applicability of Vygotsky's zone of proximal development (ZPD) in pre-service teacher training, specifically, ZPTD in lesson plan design for pre-service teacher training. The result shows that ZPTD can be applied in pre-service teacher training on lesson plan design and scaffolding can appear in between novice teachers and veteran teachers. After appropriate scaffolding, e.g. modelling, feedback and peer-monitoring from the instructor and peers, the pre-service teacher modifies the lesson plan from an immature one to a well-balanced one. Compared with the original design of the lesson plan, students are more engaged and motivated during the revised micro-teaching implementation, leading to a significant improvement in the classroom atmosphere and learning effect, which indicates that the pre-service teacher has achieved the potential development in the design of a lesson plan.

Due to the time limitation and privacy concerns, this research only collects data from a single pre-service teacher (the researcher). Future studies could invite more pre-service teachers so as to gather multiple cases and offer a more comprehensive view on the effectiveness of ZPTD in lesson plan design.

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Authors contributions

The author Minchen Gao confirms sole responsibility for the following: study conception and design, data collection, data analysis, interpretation of results, manuscript writing, and manuscript revising. The author reviewed and approved the final manuscript.

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Data sharing statement

No additional data are available.

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