# *The Formation of the Zone of Proximal Development in Elementary School Japanese Language Learning: An Analysis of the Change Laboratory Data at an Elementary School*

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***Abstract**: Elementary school represents a crucial period during which children first begin to systematically learn language in a formal educational setting. At this stage, appropriate instruction and a supportive learning environment lay the foundation for children's learning abilities and have a significant impact on their long-term intellectual development. However, in response to the contradictions between traditional language education practices and language learning objectives, the need for developmental theories in language education, and the necessity of breaking the encapsulation of school learning, there is a growing demand for creative language activities. Among these, the Russian psychologist Lev Vygotsky's theory of the Zone of Proximal Development (ZPD) offers a critical perspective for effectively promoting children's learning in elementary language education. The ZPD theory emphasizes that learning is not merely a passive acquisition of knowledge, but a socially constructed process shaped through interaction.*

*This study adopts a formative intervention methodology and analyzes data from a Change Laboratory conducted at a private elementary school in the Tokyo metropolitan area, based on the framework of Cultural-Historical Activity Theory. Through this analysis, the study explores the generation of the Zone of Proximal Development in the context of elementary language learning. First, by describing the activity system surrounding the "Wisdom of the Dandelion" play activity implemented at the school, the current state of this language activity is clarified from the researcher's perspective. Next, this study examines the process of "scaffolding," a key step in the formation of the ZPD, analyzing how*

*Actio: An International Journal of Human Activity Theory* No. 6 2025 Pp. 41–58

*children, with guidance from adults or through collaboration with more capable peers, develop from their current level of performance toward a potential level of development in language learning. Furthermore, the study analyzes the structural stages of the ZPD observed during the "Wisdom of the Dandelion" activity and discusses the realization of the cyclical structure of these developmental stages. Finally, this study seeks to offer new perspectives on traditional approaches to language learning in elementary education.*

***Keywords**: Zone of Proximal Development, Cultural-Historical Activity Theory, Change Laboratory, Language Learning*

## Introduction: Setting the Research Problem

### Research Background and Problem Statement

The fundamental stages of child development are generally divided into infancy, early childhood, preschool age, lower elementary school age, and adolescence. Appropriate instruction and a supportive learning environment during this stage form the foundation of children's learning abilities and greatly influence their long-term intellectual development.

Elementary school represents a critical period when children first begin to systematically study language in a formal public educational setting. According to the "Course of Study for Elementary Schools: Language Arts Edition" (2017 revision by the Japanese Ministry of Education), the objectives of Japanese language learning are as follows: to develop children's competencies to accurately understand and appropriately express themselves in Japanese by employing perspectives and ways of thinking through language activities. Specifically: (1) to understand the characteristics of the Japanese language necessary for daily life and use them appropriately; (2) to enhance communication skills within daily social interactions, while cultivating thinking skills and imagination; (3) to recognize the richness of language, nurture linguistic sensitivity, foster an awareness of the importance of the Japanese language, and develop an attitude of valuing and improving one's language abilities. In other words, language learning aims to equip children with both knowledge and skills and the abilities of thinking, judgment, and expression.

In order to address these challenges, the need for creative language activities has become increasingly urgent. Among the key perspectives to support such activities is the Russian psychologist Lev Vygotsky's theory of the Zone of Proximal Development (ZPD), which provides a powerful framework for effectively promoting children's learning in elementary school language education. Vygotsky (1978) defines the zone of proximal development as "the distance between the actual developmental level as determined by independent problem-solving and the level of potential development as determined through problem-solving under adult guidance or in collaboration with more capable peers." His theory suggests that learning is not a passive process of knowledge acquisition, but a process constructed through social interaction. Thus, teachers

are expected not only to act as transmitters of knowledge but also to guide and support children's learning appropriately according to their developmental stages. In elementary language learning, how children, under adult guidance or through collaboration with more capable peers, move from their current level of development to a potential level is the key process this study aims to explore.

**Research Objectives**

The purpose of this study is to clarify the process of generating the zone of proximal development within the context of elementary school language learning, in response to the objectives of language education, the need for developmental theory in language instruction, and the necessity of breaking the encapsulation of school learning. This is achieved through the analysis of data from a Change Laboratory conducted at an Elementary School.

First, by describing the activity system of the "Wisdom of the Dandelion" play activity implemented at a private elementary school in the Tokyo metropolitan area, the current state of language activities will be elucidated from the researcher's perspective. Next, the study analyzes the process of "scaffolding," a crucial step in the formation of the zone of proximal development. Furthermore, the study examines the structural stages of the zone of proximal development within the language activity and discusses the feasibility of realizing a cyclical structure of these developmental stages. Finally, the study aims to offer new perspectives on traditional approaches to language learning.

**Research Methods and Methodology**

This study adopts the methodology of formative intervention. Recognizing the need to reconstruct a more general concept of agency based on Vygotsky's method of double stimulation, Engeström (1987/2015) introduced the concept of formative intervention.

Vygotsky (1978) described the method of double stimulation as follows:

> In the experimental context, the tasks that the child faces usually exceed their current capabilities and cannot be solved using existing skills. In such cases, a neutral object is placed near the child, and we often observe how this neutral stimulus is drawn into the situation and begins to function as a sign (Vygotsky, 1978, pp. 74–75).

Engeström (2016, p.221) outlined four epistemic threads or tenets as elements of an argumentative grammar for the methodology of formative interventions: (1) activity system as unit of analysis, (2) contradictions as source of change and development, (3) agency as a layer of causality and (4) transformation of practice as expansive concept formation. These four are not meant to be an exhaustive set.

Change Laboratory represents the forefront of current formative intervention methodologies. In Change Laboratory, to facilitate analysis and resolution

of the problems, interventionists typically introduce conceptual tools, such as the triangular models of activity systems, as second stimulus. Commonly the conceptual models offered by the interventionist are replaced or combined with mediating conceptualizations and models formulated by the participants (Engeström, 2016, p. 227).

In this study, the analysis of language activities within elementary school language learning was conducted based on Vygotsky's theory of the zone of proximal development. Using the triangular model of the activity system and introducing a second stimulus, this study aimed to clarify the process through which the zone of proximal development is generated. Employing the methodology of formative intervention was essential for this research.

## Theoretical Framework of This Study

### The Theory of the Zone of Proximal Development

The theoretical foundation of this study is Vygotsky's theory of the zone of proximal development, which constitutes one of the core concepts of cultural-historical activity theory. This theory elucidates the social origins of individual psychological development. In the 1930s, Vygotsky proposed the concept of the zone of proximal development, making it a crucial element of his broader cultural-historical theory of development. Vygotsky creatively revealed the dialectical relationship between education, learning, and development.

Vygotsky (1978) defined the zone of proximal development as:

> The distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers (Vygotsky, 1978, p. 86).

This theory distinguishes two developmental levels: the "actual developmental level," which refers to tasks that learners can accomplish independently without external assistance, representing their current cognitive abilities; and the "potential developmental level," which refers to tasks that learners can accomplish with external support, indicating the cognitive heights they can potentially attain. The zone of proximal development is the gap or range between these two levels, reflecting the learner's developmental potential.

Education, according to Vygotsky, awakens and promotes the maturation of a set of functions that lie within the zone of proximal development. In effect, the zone of proximal development highlights the role of joint activity in the construction of meaning. Children construct meaning with the help of more capable others, emphasizing the social nature of learning. Through collaborative activities, teachers, students, and even the nature of the tasks evolve over time, involving complex adjustments among participants.

Regarding the core concepts of the zone of proximal development, scholars

worldwide have provided multifaceted interpretations, leading to extensive research. As summarized by Engeström (1987/2015, pp.135–136), a common thread in these interpretations is the use of the zone of proximal development as a logical foundation for various versions of "dynamic assessment of intelligence" (see Brown & French, 1979; Day, 1983). Another common interpretation takes the zone of proximal development as a rationale for creating social situations or environments where instructional support is given to children, thus enabling children to acquire new skills in a new way, through joint problem solving and interaction. The notion of "scaffolding" (see Wood, Bruner, & Ross, 1976; Wood, 1980) is a product of this line of interpretation, as is Cazden's (1981) work on children's speech acquisition, and so are several contributions to the important volume edited by Rogoff and Wertsch (1984).

Engeström (1987/2015, pp.135–138) noted that neither one of these common interpretations does full justice to Vygotsky's conception. And he reconceptualized the zone of proximal development as the distance between the present everyday actions of the individuals and the historically new form of the societal activity that can be collectively generated as a solution to the double bind potentially embedded in the everyday actions.

Additionally, Wei Ge (2023) emphasized that the core of the zone of proximal development lies in its "develop mentality," characterized as a multifaceted and long-term dynamic process.

**Scaffolding**

Scaffolding, based on Vygotsky's theory of the zone of proximal development, was first proposed by renowned cognitive psychologist Jerome Bruner in the 1950s. The term "scaffolding" was originally used in the construction industry to refer to temporary structures that workers use to support their work while constructing a building. Scaffolds are essential tools for construction work, enabling workers to perform tasks at elevated heights and complete buildings. Once the construction is finished, the scaffolding is removed. In this sense, scaffolding serves as a temporary support that is removed after the goal has been achieved.

Wood, Bruner, and Ross (1976, p. 90) defined scaffolding as "the process that enables a learner to solve a problem, carry out a task, or achieve a goal." In this concept, scaffolding is regarded as a method for assisting learners in acquiring new linguistic structures. Simply put, when learners face difficulties or require assistance during the learning process, the guidance and support provided by the teacher correspond to "scaffolding." In short, scaffolding refers to temporary or provisional support tools provided to facilitate goal attainment. After the goal is reached, the scaffold is withdrawn. The purpose of scaffolding is not only to solve immediate tasks but also to gradually develop the learner's ability to solve problems independently once the scaffold is removed.

Instructional approaches based on scaffolding emphasize the collaborative process through which teachers and children work together to achieve goals.

Through the teacher's support, children progressively build their own knowledge and cultivate the ability to complete tasks independently.

**The Phase Structure of the Zone of Proximal Development**

Engeström (1987/2015, p.149) depicted the phase structure of the zone of proximal development as a general cycle of expansion. As shown in Figure 1, "the phase structure of the zone of proximal development" cycle provides a step-by-step explanation of how the zone of proximal development is generated and serves as a framework for illustrating the developmental process. This structure centers on contradictions and transformations, characterized by the evolution of new activities through interactions with existing activity systems. The following outlines the specific processes involved in " the phase structure of the zone of proximal development."

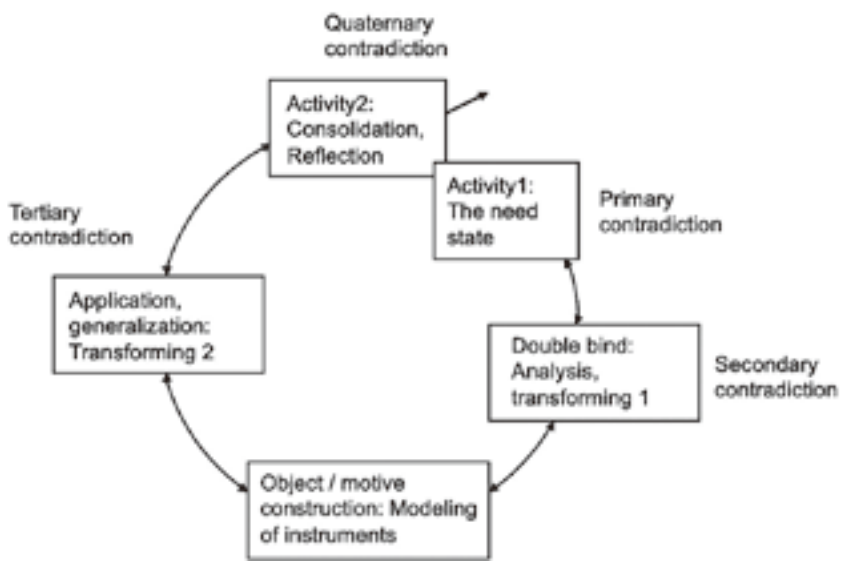


Figure 1: The phase structure of the zone of proximal development. (Engeström, 1987/2015, p.150)

In the initial stage, "Activity 1: The need state," the first contradiction arises. Although it appears that numerous options are available, the individual is in a state of wanting to "pursue the possibility of change" for their true self.

Next, within the double bind, the individual engages in thought experiments and internal dialogues to analyze and reflect on the initial contradiction. In this stage, contradictions within the old activity system become visible, and through concentrated actions (experimental acts) directed at these contradictions, the individual explores new perspectives and directions. This stage, known as the "First Learning Action," serves as an important process for deepening the contradictions within the old activity system.

In the third stage, the object and motive supporting the new activity system are modeled. Here, a new general model is created, functioning as a springboard for further activity. During the modeling process, tools and means for promoting new activities are identified. These tools and means, in turn, generate internal contradictions within the emerging activity system, laying the foundation for the next stage. This stage involves creative and potential learning actions and provides a prototype for new forms of activity.

In the fourth stage, the new actions are applied and begin to expand, although still constrained by the old activity system. This process corresponds to "Transformation 2." Initially, new actions emerge subordinated to the resistance and motives of the old activity system. However, through diversification and differentiation, they gradually establish a generalized presence. In this process, it becomes necessary for the subject to form new social rules, a new division of labor, and a new community to overcome competition and contradictions between the old and new activities.

In the final stage, the new activity system is socially integrated. At this point, the new activity, while maintaining internal coherence, interacts with adjacent activity systems, leading to the formation of new double binds. As a result, the new activity ceases to be "new" and becomes established as a part of the broader social network. At the same time, new contradictions and disturbances arise, initiating the next cycle of development.

To define the entire cycle as the basic unit of expansive learning, and consequently of developmental instruction, means that we are dealing with learning processes of considerable length. (Engeström, 1987/2015, p.152). At the same time, through this cycle, it is possible to analyze the sequential structure observable within the zone of proximal development.

## Presentation of Change Laboratory Data in the Elementary School

### Change Laboratory

In Change Laboratory, researchers assist practitioners in identifying contradictions within their activity systems and in interpreting the double binds they experience in their daily activities (Virkkunen & Ahonen, 2011). In the analysis and design, the participants are asked to move between the past, the present and the future. This means that historical origins of the current problems are dug up and modeled, and the ideas towards a future concept are played with in anticipatory simulations such as role-play. The laboratory sessions themselves are videotaped for analysis and use as stimuli for reflection. The procedure allows for the collection of rich longitudinal data on the actions and interactions involved in cycles of expansive learning (Engeström, 2001a; Engeström, 2016, p.227).

According to cultural-historical activity theory, the Change Laboratory method effectively facilitates communication and interaction among members, allowing for the development and implementation of new ideas within an orga-

nization. This approach not only helps solve current problems but also promotes innovation, learning, and development within the organization. Furthermore, Change Laboratory encourages the establishment of "knot-working" in organizations, bringing relevant individuals into discussions at critical moments. In some cases, the outcomes of a Change Laboratory can trigger long-term transformations within the organization. Overall, Change Laboratory is a highly effective method for promoting learning and innovation in organizations and workplaces.

One of the key advantages of Change Laboratory is its ability to sharply target existing problems while flexibly responding to changes in internal and external conditions during the research period. However, this method also entails an inherent unpredictability: the "concepts, principles, and procedures of Change Laboratory" can only become clear through actual implementation.

**Data from the Change Laboratory at the Elementary School**

The subject of this study is a private elementary school located in the Tokyo metropolitan area. This school continues to uphold the principle of "education based on scientific research," one of the four educational principles established at the time of the school foundation over a century ago, applying it actively in its guidance of children. As of 2024, the school's mission, posted on its official website, is to provide "a place where students firmly acquire foundational skills and deepen interpersonal relationships," which outlines the future vision of the school. Respecting the natural freedom children should inherently possess, the school fosters an environment that supports natural growth, enhances scientific understanding of nature and society, and cultivates intellectual and emotional development alongside technical skills, creativity, expressive abilities, and physical and athletic growth. Furthermore, it aims to develop the ability to build smooth interpersonal relationships, striving to nurture well-balanced individuals.

In this elementary school, the subject of Japanese language education is positioned as a "technical and skill-based subject." The aim is to develop students' abilities both to understand and to express themselves through language, and to apply these abilities effectively. The school emphasizes both enriching fundamental competencies and fostering each student's individuality through a diverse curriculum. Unique subjects and activities not commonly found in other schools, such as "play," "walks," "connections," "theater," "video," and "dance," have been specially established. These activities not only realize the school's vision but also promote interdisciplinary learning across subjects.

This article bases its analysis on the educational philosophy and distinctive features of the school, focusing on data from the third Change Laboratory session held on May 19, 2023. This session involved discussions about a theatrical activity based on the Japanese language lesson "The Wisdom of Dandelions" conducted with second-grade students.

The intervention research team and the teachers collaborated to design educational experiments, analyzing and redesigning their own educational practice activity systems through a full-scale Change Laboratory series (each session lasting approximately 2–3 hours), held monthly from March 2023 to March 2024, for a total of ten sessions. The teachers and intervention researchers used a room inside the school as the meeting venue. Sessions were held about once a month on Fridays after school hours, starting at 5:00 PM, with each session lasting around 2–3 hours. Teachers participated voluntarily in each Change Laboratory session. All sessions were video- and audio-recorded, and these recordings became the primary data for this research project. Transcriptions of all recordings were also produced.

## Activity Theory Analysis of the "Wisdom of Dandelions" Drama Activity at the Elementary School

### The Activity System in the "Wisdom of Dandelions" Drama Activity

The first stage of developmental work research based on activity theory involves initially gaining preliminary insights into the phenomena—the nature of the discourse and problems experienced by participants in the activity—and then providing a detailed description of the activity system under investigation (Engeström, 1987/2015).

In traditional Japanese language learning, the activity system is structured as shown in Figure 2. The subjects are the teachers and students, while the object is the acquisition of "knowledge and skills" as well as "thinking, judgment, and expressive abilities" through the study of the explanatory text Wisdom of Dandelions.

The tools mediating the activity include the textbook, language itself, and

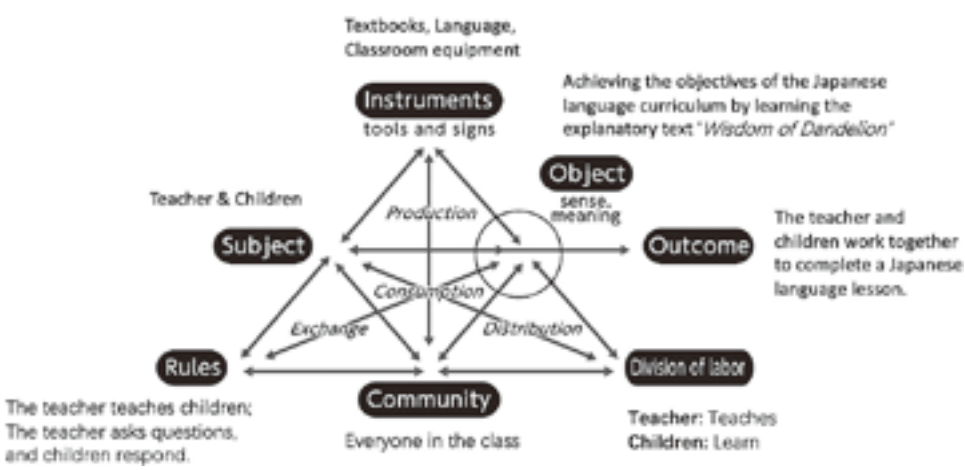


Figure 2: Activity System in Traditional Japanese Language Learning

the equipment within the classroom. The rules are based on the format of "whole-class instruction," where the teacher transmits pre-existing knowledge to the students, poses questions, and students respond to them. The community consists of everyone present in the classroom, while the division of labor assigns the role of "teaching" to the teacher and "learning" to the students.

The outcome is the successful completion of a Japanese language lesson by both teachers and students. In such lessons, the content of the explanatory text is covered systematically, and activities such as reading aloud, listening, speaking, reading, and writing are conducted.

However, in such classes, doubts remain as to whether the objectives set forth by the Japanese language curriculum are truly being achieved. In other words, after the teacher and students have completed their study of the text, can the students understand the characteristics of the Japanese language needed in daily life and use it appropriately? Are they able to enhance their communication skills in everyday interactions, and nurture their thinking and imagination abilities? It is questionable whether sufficient Japanese language literacy is being cultivated.

For example, there are contradictions regarding whether students can accurately visualize the scene described as "the stem of the dandelion droops limply onto the ground," or concretely imagine the situation depicted by the words "on a clear and windy day, the white parachute-like seeds open fully and fly far away." These scenes are difficult to fully depict with language alone, and if students cannot grasp the states that these words aim to express, it may be difficult for them to use such language appropriately in the future.

Given the emergence of these contradictions, the need for transformation became apparent. Against the backdrop of the Elementary School's special


Figure 3: Activity System in the "Dandelion's Wisdom" Drama Activity

subject "Drama," the second-grade Japanese language teacher proposed a method of learning the explanatory text through the form of a play.

The activity system in the "Dandelion's Wisdom" drama activity, as shown in Figure 3, involves the teacher and the students as the subjects. The objective remains the same as in traditional learning: acquiring "knowledge and skills" as well as "thinking, judgment, and expression abilities" in Japanese language through studying the explanatory text, "Dandelion's Wisdom." The tools used as mediators include not only the textbook and language but also the body and the stage of the drama. The rule is to complete the performance of the play with the entire class through dialogue and collaboration. The community consists of the whole class, and the division of labor is decided through a collaborative reading of the script between the teacher and the students. The teacher's role is to guide the rehearsal and performance of the entire play, while the students are divided into roles such as narrators, "flower" characters, and "stem" characters. In this way, through learning via the drama activity, an attempt was made to achieve the goals of Japanese language education for the "Dandelion's Wisdom" explanatory text through a new method.

**Scaffolding in the "Dandelion's Wisdom" Drama Activity**

In the third meeting of the Change Laboratory, a discussion took place about observing the "Dandelion's Wisdom" drama lesson, as follows:

> Intervention Researcher A: ... So, today, when I watched Mr. K (the 2nd-grade teacher)'s drama lesson.
> Teacher A: Oh, I want to hear about that.
> Intervention Researcher A: Well, I was surprised because they turned the explanatory text into a drama.
> Teacher A: Oh!
> Intervention Researcher A: That was completely unexpected.
> Teacher A: Really?
> ... (Omitted)
> Intervention Researcher A: When we try to approach the meaning of the words in a traditional language class, there are things we cannot quite reach, but through drama, in a sense, children are given the "scaffolding" of using their bodies, which creates the "zone of proximal development." This allows them to cross over into that zone.
>
> (From the third Change Laboratory meeting)

Intervention Researcher A referred to the "scaffolding" provided using children's bodies, which creates the zone of proximal development. Scaffolding is an important process in generating the zone of proximal development. According to theoretical research by Wood and Bruner (1976, p. 98), in scaffolding teaching based on the zone of proximal development theory, it is necessary to design a variety of appropriate learning scaffolds based on the

child's specific learning situation and the progress of instruction. The following summarizes the five key steps of scaffolding.

The first step is the construction of the scaffold. When constructing scaffolds for Japanese language learning support, it is necessary not only to base it on the child's current cognitive level but also to design it in combination with the instructional goals of the material. By constructing scaffolds based on the child's "zone of proximal development," it is possible to maximize the educational effect. Regarding this issue, the content discussed by the homeroom teacher at the third Change Laboratory meeting when selecting the script (text) is as follows:

> Teacher B: ... I didn't think I would do the drama using the explanatory text, but when I studied "Dandelion's Wisdom," the children, well, one of my themes this year is connecting body and words, and when I read "Dandelion's Wisdom" aloud and then read it with the children, when I made them consciously use their bodies while reading, they naturally started to move. When they move, they tend to want to go beyond the classroom size, so they begin to engage in activities in the larger classroom. As this happened, the children naturally said, "This is a play," and the desire to perform drama spread.
>
> (From the third Change Laboratory meeting)

The selection of the script was within the scope of the same-grade Japanese language textbooks. The homeroom teacher thought from the children's perspective and, when reading with them, consciously linked the "bodily awareness" to the content of the explanatory text. It was confirmed that the scaffolding was within the zone of proximal development based on the learning content. Furthermore, this drama activity was implemented after reading the corresponding passage aloud in class. In other words, the children already had a certain understanding of the vocabulary, kanji, structure, and content required for this text, forming their "current development level." This is where the homeroom teacher proposed the drama activity and provided scaffolding using the body, building a foundation for the children to progress to the next developmental stage.

The second step is the setting of the situation and the presentation of the theme. According to the recorded video, the learning environment begins to change in this stage. In the first part, the teacher introduces the content and process of the drama activity in the classroom. After the children express their thoughts on the text, roles are assigned. In the latter part, the setting changes from the classroom to the school theater, where the teacher provides stage instructions, and the first rehearsal begins. It is noteworthy that a total of three rehearsals were recorded in the video. Between each rehearsal, the teacher used guiding words to encourage the children to reflect on aspects of their previous performance where their language expression was lacking.

The third step is independent inquiry. As the formal rehearsal progresses, the children enter "performance mode," which is essentially their process of independent inquiry. At this stage, each child uses their body to understand and express the content of the text. For example, in the scene where the dandelion flower wilts, how can they use their body to express the "wilting" state? Similarly, after the dandelion turns into white fluff, how can they show the spreading of the fluff using their body? These are tasks in which children must express their understanding and feelings through their bodies.

The fourth step is collaborative learning. This is also a very important part of the zone of proximal development theory, which emphasizes "solving problems through collaboration with more competent peers" to reach the "potential development level."

Regarding the significance of the "drama" lesson, the following discussion took place at the third Change Laboratory meeting:

> Teacher C: I believe the drama lesson is essentially about building human relationships. Of course, expression skills are important, but without a sense of security, those expression skills cannot connect to actual expression. So, I see drama time as a space for building relationships among children, between children and teachers, and among children themselves.
> ...
> Intervention Researcher A: I think that's a unique perspective. It's interesting that you connect human relationship building and drama in this way. It seems that you're considering the education and development of children in this way, and you recognize the potential of drama as a medium to bring that out.
>
> (From the third Change Laboratory meeting)

From this conversation, the drama lesson helps build human relationships. This meets the conditions for generating the zone of proximal development. How did this show up in practice? Next, I will introduce an episode that occurred during rehearsal.

During the first rehearsal, a child who was responsible for narration encountered a situation where they couldn't read the script. The line "By raising the height, the fluff is better hit by the wind, and the seeds can be blown far" caused Child A to show signs of not being able to read. Immediately, the other children looked at Child A's script and taught them how to read it. By the second rehearsal, Child A no longer encountered this situation. In the third rehearsal, Child A hesitated for a few seconds at the same part of the script but then read it correctly on their own. Then, during the next narration, Child A paid attention to whether Child B, who was narrating, needed help with reading. That is, Child A was now assisting others, just as they had been helped earlier. This process showed that with the help of more competent peers, the child was able to read correctly.

At this stage, the children were able to freely express their own thoughts and exchange opinions in a collaborative environment based on their own inquiries. Intervention Researcher B pointed out during the third Change Laboratory meeting that, "As society becomes more diverse, by incorporating diverse thoughts and perspectives, it's important to not just focus on one's own opinions, but to also consider the opinions of others in order to make society and activities better. This was something that was said during the drama lesson, and I was very impressed by how well it supported social-emotional development." This shows that through cognitive conflict, learning problems were addressed and resolved, fostering the abilities of collaboration, interaction, and independent thinking.

The fifth step is the evaluation of effectiveness. At this stage, the children's progress from their "current developmental stage" to their "potential developmental stage" becomes clear. Specifically, the process of transitioning from abstract concepts to concrete expression in the performance of the explanatory text can be observed.

During the third Change Laboratory meeting, the following comments were made regarding the "Dandelion's Wisdom" drama lesson:

> Intervention Researcher C: ... Using the language textbook, creating a flow of events, just creating a sequence of "this happens, and then that happens" wouldn't have produced the clear differences we saw after three rehearsals. I think the key to the differences was the teacher's questioning, which was excellent.
> Intervention Researcher B: As a specialist in developmental psychology, I'd like to share my thoughts from that perspective. ... Each child has different personalities, characteristics, and talents, and also different attitudes toward the lesson, how they listen, their reading skills, and so on. The teacher has done a wonderful job building teamwork and bringing everyone together, which really impressed me.
>
> (From the third Change Laboratory meeting)

From the perspective of Japanese language learning, through the reading and rehearsal of the script, the children's reading ability improved. The fluency of their readings increased as the rehearsals progressed. Moreover, during the rehearsal process, the children were able to understand the general content by considering the development sequence of the events in the text. Additionally, through the teacher's questions during rehearsals, important words and sentences were selected, and their understanding deepened by expressing them through their bodies. This helped build a solid foundation for more effective use of language. Thus, the entire process of Japanese language learning through scaffolding can be considered completed. The generation of the zone of proximal development is clearly captured by comparing the effects of each rehearsal.

## The Stages of the Zone of Proximal Development as Seen from the "Dandelion Wisdom" Drama Activity

In the above analysis, the process of generating the zone of proximal development at a certain learning stage through "scaffolding" was clarified. However, it is also evident that "scaffolding" has its limits. First, scaffolding refers to acquisition of discrete skills and actions, not to the emergence of long-lasting molar activities. It is a "largely spatial metaphor, in which the temporal aspect of the construction of the whole remains as a residual, unanalyzed aspect of the living process" (Griffin & Cole, 1984, p. 48). Second, the idea of scaffolding is restricted to the acquisition of the given (Engeström, 1987/2015, p. 135). In other words, scaffolding-style instructional methods struggle to fulfill the long-term, sustained, and creative aspects of the learning process. This is because the nature of scaffolding is a rigid structure, which cannot, in itself, be a dynamic process.

So, how is the zone of proximal development structure generated in long-term learning processes? In this regard, we will consider the model proposed by Engeström and discuss it based on Table 1 below.

First, in the state of desire, the subjects (teachers and children) wish to reach the objectives of the Japanese language subject through the study of expository texts. However, a contradiction exists between traditional Japanese language learning and the objectives.

Then, in the analysis and transformation stage, the teacher and the children realize that while reading the expository text "The Wisdom of Dandelions," their bodies naturally start moving when they encounter certain sentences. At this point, the possibility of connecting the text "The Wisdom of Dandelions" with drama is considered.

Next, the teacher transitions the Japanese language lesson from the classroom to the school theater stage and constructs a "bodily" scaffold for the children. Through this approach, the children are able to more deeply understand the content expressed by words and sentences, and their imagination and expressive abilities are fully brought out.

Furthermore, in the application and generalization stage, the process of prolonging the learning progresses. At this stage, new rules, roles, and communities are formed. After the first rehearsal, the teacher analyzes the issues and points out where the children were unable to express the words adequately during the rehearsal. They are made to think about more accurate ways of expression. Through this process, the children make progress from their current developmental level to a potential developmental level.

Finally, by this point, it is confirmed that one cycle of the zone of proximal development has already been generated. However, even at this stage, challenges and contradictions remain. Therefore, the insufficient points are analyzed, and the children are guided to move on to the next developmental stage. Through this process, the next cycle is generated, and the developmental potential and sustainability of the zone of proximal development are validated.

Table 1: The Phase Structure of the Zone of Proximal Development Seen in the 'Dandelion Wisdom' Drama Activity

| contradiction | stage | Dandelion Wisdom Drama Activity |
|---|---|---|
| First contradiction within the internal components of the old activity | Activity 1: Need State | There is a contradiction between the effectiveness of traditional Japanese language learning and the goals of the Japanese language curriculum. |
| Second contradiction between the components of the old activity | Double Bind | The possibility of connecting the explanatory text "The Wisdom of Dandelions" with a play is considered. |
| | Object/Motivation Construction | The teacher transitions the Japanese language lesson from the classroom to the school theater stage and constructs a "physical" scaffold for the children. |
| Third contradiction between the old and new activity/motivation | Application, Generalization; component actions of the given new activity | For each component of the new activity:<br>New rules, division of tasks, and a community are formed;<br>Progress from the current developmental level to the potential developmental level. |
| Fourth contradiction between the new activity and adjacent activities | Activity 2: Reflection, consolidation | At this stage, challenges and contradictions remain. Therefore, contradictions are analyzed, and the children are guided to progress to the next developmental stage. |

## Conclusion

Through the activity-theoretical analysis of the "Dandelion Wisdom" drama activity, the following two conclusions were drawn:

First, it was confirmed that in the language activities of elementary school Japanese language learning, by the teacher constructing "scaffolding," the children are effectively able to reach their potential developmental level from their current developmental level. Specifically, through the five stages of scaffolding, a "physical" scaffold was built through the "Dandelion Wisdom" drama activity, and the creation of the zone of proximal development was realized. This helped develop knowledge, skills, thinking ability, expressiveness, and judgment ability in Japanese language learning.

Second, while scaffolding plays a role in generating the zone of proximal development in elementary school Japanese language learning, its limitations are also pointed out. Specifically, scaffolding is not sufficient in terms of aspects such as long-term, sustainability, and creativity. The singular process of scaffolding alone cannot fully explain the overall meaning of the zone of proximal development. Therefore, for the learning group to engage in long-term learning activities, the cycle of the zone of proximal development stages, as proposed by Engeström (1987/2015), is considered effective for verifying its development and sustainability. It is believed that simply generating the zone of proximal development through scaffolding in elementary school Japanese language learning is insufficient. Utilizing the phase structure cycle of the zone of proximal development and promoting the emergence of new activities is key to supporting long-term learning activities of the learning group.

This article clarified the applicability of the zone of proximal development theory in elementary school Japanese language learning through the analysis of language activities and demonstrated the process of generating the zone of proximal development by constructing scaffolding as a tool in language activities. However, the paper did not address how the zone of proximal development might be generated to overcome the contradiction of encapsulated school learning in elementary school Japanese language learning.

According to the "zone of proximal development" four-quadrant model in school lessons, when viewed on the horizontal axis, the shift is required from teaching textbook knowledge and correct answers to teaching how to ask questions and discover principles. When viewed on the vertical axis, it is necessary to expand from learning in the encapsulated classroom to learning linked with external environments. To generate the zone of proximal development in such a state, it remains an important future task to investigate how teachers can construct scaffolding for children and what support intervention researchers can provide.

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