Working paper number 44 –

Wang, Y. Li, L, Fleer, M. and Ma, Y. (2023). Creating Conditions for Chinese Kindergarten Teacher's Professional Development in Play-based Setting. *Early Years.* https://doi.org/10.1080/09575146.2023.2205055

Creating Conditions for Chinese Kindergarten Teacher's Professional Development in Play-based Setting

Abstract

Although Chinese early childhood education policies have high expectations for kindergarten teachers' play pedagogy, teaching and play are still discussed as a bifurcation in Chinese kindergarten daily practice. To support Chinese kindergarten teachers' play pedagogy, an educational experiment (EE) was conducted framed by the cultural-historical theory in this study. Two teachers and 34 children (4-5 years) participated in this study. The findings indicate that EE creates a new social situation that can motivate teachers' development in collaborative teaching. Moreover, the collective reflection and Conceptual PlayWorld implementation within the EE amplified teachers' play pedagogy development. We argue that the EE works as a source of teachers' professional development and builds their identity as experts in creating playful learning environments in Chinese cultural context.

Keywords: Cultural-historical theory; educational experiment; the Conceptual PlayWorld; professional development; play-based setting.

1 Introduction

The benefit of promoting children's development in play is generally recognised in research. Play can facilitate children's learning such as social skills (Jankowska & Omelanczuk, 2018), academic learning (Yang et al., 2022), moral imagination (Li et al.,

2021), children literacy (Marklund & Dunkels, 2016) and so on. Research also shows that play can support teachers' intentional teaching (Wu & Goff, 2021). For example, a play-based setting can provide teaching opportunities in multiple subjects such as mathematics (Disney & Li, 2022), engineering (Lewis et al., 2019), or STEM generally (Stephenson et al., 2021). Taken together, the research indicates the significance of supporting children's academic development in play (Weisberg et al., 2013), something that is also important in the Chinese context.

Learning through play has been valued in Chinese kindergarten for a long period. Since the enactment of the Working Rules for Kindergarten (Trial) (The State Education Commission of the PRC, 1989), play has been put in an important position in the Chinese kindergarten curriculum. With the advancement of curriculum reform, this requirement has been put in the general rules of kindergarten education (Ministry of Education, 2001). The value of play has persisted in the current Chinese early years context.

Although there is a broad agreement that play provides rich prior knowledge for learning, teaching and play are still discussed as a bifurcation in the Chinese kindergarten daily practice (Li et al., 2022). In line with the traditional Chinese proverb that *achievement is founded on diligence and wasted upon play*, play and learning are considered in opposition to children's development (Wu & Rao, 2011). Learning is seen as a serious activity; play is still seen as an activity for leisure and entertainment. A contradiction between the policy requirement and Chinese kindergarten teachers' value of teaching makes it difficult for teachers to implement learning experiences in play in daily practice (Qiu, 2011). In response to the demand from the policy, play is used by teachers to attract children's attention or reward for activity complement rather than used as a pedagogy to support learning (Qiu,

2011). The contradiction that teachers face highlights a research need into how to resolve this contradiction so that Chinese kindergarten teachers can meet the policy demands.

To support teachers' development, *the Professional Standards for Kindergarten Teachers—Trial version* (Ministry of Education, 2012) requires teachers to collaborate with colleagues and share teaching resources, and experiences, and develop together. The requirement reflects a unique Chinese kindergarten context because Chinese kindergartens provide great conditions for teachers to develop as a team. Normally three teachers work in a team within one kindergarten classroom, namely the lead teacher, the teaching assistant (Mowrey & Farran, 2021) and the carer. The ways teachers collaborate in teaching is variable and based on institutional demands. In most kindergartens, teachers collaborate in a "one teach, one assist" approach (Hsieh & Teo, 2021). This means, one teacher leads either the morning routine or afternoon routine, while the other teacher provides support to the teacher. Both teachers need to prepare, teach, and plan the class together, which indicates that effective teamwork is crucial for Chinese kindergarten teachers in daily practice. The carer of the class is responsible for children's health care and assisting with teaching if needed. This working environment provides conditions for teachers to develop as a team because teachers have the chance to learn from each other. The aim of this paper is to present the results of a study into teacher's development as a team drawing on an educational experiment into learning and play in a Chinese Kindergarten. To achieve this aim, we begin with a brief literature review, followed by the study design, findings, discussion and conclusion.

2. Literature Review

The present study sits within the broad context of early childhood teachers' professional development (PD) and focuses on teachers' PD in the Chinese early childhood

context. Professional development is found necessary in the international early childhood setting because it benefits teachers' development (Patton et al., 2015) and children's learning and development (Hanno & Gonzalez, 2019). For teacher development, PD can support subject teaching such as maths (Llinares et al., 2019), science (Sakin, 2020) and STEM (Brenneman et al., 2019). For example, Brenneman et al. (2019) create a model to support educators' STEM education. The model empowers preschool educators to provide high-quality STEM education for preschool children. The model provides valuable research-based experience for conducting a PD.

Successful professional development also has a positive impact on children. It is identified that children's outcomes become greater when the PD program is aligned with children's developmental goals (Brunsek et al., 2020). Hanno and Gonzalez (2019) examine a large-scale professional development intervention and argue that the PD shows the potential of improving the teacher-child interaction quality by reducing children's absenteeism by about 6.0 percentage points. Petersson Bloom (2021) draws attention to PD's impact on special education. The study reports on a professional development programme to enhance awareness of inclusive education in preschool. The program implementation increases autism awareness among professionals and benefits children with special needs.

To successfully support teachers' and children's development, an effective PD is essential. Two important characteristics that lead to effective professional development are summarised in the literature. First, continuous and ongoing support for teachers is reported as critical in an effective PD (Brenneman et al., 2019; Nooruddin & Bhamani, 2019; Sakin, 2020). Brenneman et al. (2019) argue that including educators in the ongoing design is one of the best practices of PD. In addition, ongoing PD is reported to promote collaboration between teachers (Nooruddin & Bhamani, 2019). Moreover, teachers have the chance to

reflect on their practice and internalise the concept into classroom practice in ongoing PD. Second, external expertise is also important in supporting a successful PD because external expertise can motivate teachers' reflective discussion which creates conditions for their PD (González et al., 2016). Brunsek et al. (2020) conduct a systematic review and argue that expertise can provide feedback to support teachers' educational practices. These studies add research-based evidence to conduct an effective PD program in early childhood settings.

The benefits of effective PD programs in the early years present the beginning point of implementing PD in China. However, to conduct a PD in China, there is more to be known about the PD programs conducted in the Chinese cultural context. For the past ten years, Chinese kindergarten teachers' quality improvement has been put into an important position following the *Outline of the National Medium-and Long-Term Programme for Education Reform and Development* (Ministry of Education, 2010). The central and local governments actively raised funds and organised national and provincial training programs for kindergarten teachers (Zhu, 2012b). Acknowledging the importance and value of kindergarten teachers' professional development, many researchers draw their attention to the national and provincial training programs and propose that the professional training should 1. Support teachers' content knowledge development (Guo et al., 2022); 2. Contextualise the training knowledge in the kindergarten practice (Zhu, 2012a), especially in play-based settings (Guo et al., 2022).

Taken together, conducting an effective PD for Chinese kindergarten teachers requires

1. Ongoing support from external experts;

2. Supporting teachers' content knowledge development in practice.

Although suggestions have been proposed to improve professional training, there is less empirical research that explores Chinese kindergarten teachers' professional development process. It is shown that researchers can provide effective PD for teachers by conducting an educational experiment (Fleer et al., 2022), but this has received limited attention in China (Li et al., 2022). Therefore, the study reported in this paper used an educational experiment (EE) to introduce a new play pedagogy into a Chinese kindergarten (Conceptual PlayWorld, Fleer (2018)) to support teachers' play pedagogy. Through an educational experiment, this study sought to answer the research question: How do the new conditions of an educational experiment change the professional practices and conceptualisation of play pedagogy for Chinese teachers?

3 Cultural-historical View of Teacher's Development

From a cultural-historical view of development, teachers experiencing difficulties or contradictions can be seen as a positive factor to motivate individual developmental processes (Vygotsky, 2019). Therefore, a key factor in supporting teachers' development is for researchers to work with teachers on their professional practices and conceptualisation of play. In this theorisation, the challenges of the Chinese context to introduce play pedagogy can be viewed as opportunities for teacher development (Sagre et al., 2022). Given the current situation that Chinese kindergarten teachers are facing, this study takes on a cultural-historical lens to help understand teachers' development. We introduce our theorisation of teachers' development as a foundation for the study design and findings that follow. First, we will introduce the reason for using the cultural-historical theory to understand teachers' development. Second, we discuss a cultural-historical conception of the

social situation of development to explain our analysis of the development of teachers during the educational experiment.

The genetic law of development (Vygotsky, 1997) illustrates that an individual's higher mental function starts from the social interaction between people, and then becomes internalised to serve an individual's development. This showcases how the social situation creates conditions for development through the interaction between people. The theoretical framework gives "a fertile ground to explore teacher development as this theory focuses on the role that culture plays in human interactions" (Eun, 2011, p. 330). Fleer (in press) proposes that for adults, the institutional context might work as a source for adults' development. Based on this, a kindergarten classroom could be an important social situation for Chinese preschool teachers which creates potential developmental conditions for teachers to develop their play pedagogies as a team.

This study uses the concept of the social situation of development (Vygotsky, 1998) to understand a teacher's development. The social situation of development represents the initial moment of the relation between an individual's development and the social environment in a certain age period (Vygotsky, 1998). Edwards et al. (2019) find out that the realisation of the social situation of development depends on how teachers positioned themselves within the social situation. This research showcases the possibility of using the concept of the social situation of development to understand teachers' development. Standing on this theoretical framework, the concept of the social situation of development leads this study to focus on the relationship between teachers and the kindergarten context to understand Chinese kindergarten teachers' developmental process.

The development of an individual is a complex process, which has a close relationship with the environment. Therefore, the social situation should be considered when trying to

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understand a teacher's practical changes within the institution. In addition, how teachers understand the social situation needs to be considered, because "individual's development cannot be understood only through the analysis of the social situation around them, but also how individuals refract the situation" (Bozhovich, 2009, p. 60). It is to say that not every social situation can become a social situation of development. Only those in line with an individual's developed motives can become the individual's social situation of development. Therefore, this study not only interprets how the social situation impacts teachers, but how teachers refract on the new social situation is also understood.

When a play pedagogy is introduced to teachers, a new activity setting is generated which brings new demands for teachers. The contradiction between teachers' capabilities and the new demand from the social situation can be seen as a motivating force that drives the developmental process (Hedegaard, 2019). Therefore, the play pedagogy as a new social situation brings possibilities for Chinese kindergarten teachers' development as a team.

To capture teachers' development in play, there are two important aspects that this study needs to pay attention to, the first one is how we define play. Drawing on a cultural-historical perspective, play is a process of creating an imaginary situation where players change the meaning of objects and actions and give them a new sense. When play is happening, there are roles and rules stemming from the imaginary situation (Vygotsky, 1966). The definition of play directs the study to focus on the imaginary situation that teachers and children created. The second one is to clarify what is development. An individual's development is conceptualised as "a qualitative change in his or her motive and competencies" (Hedegaard, 2008a, p. 11). To be specific, the development is not a quantitatively increased process, but a qualitative transformation. Taken together, this study focuses on how teachers change their professional practice within an educational experiment.

4 Methodology

Drawing upon a cultural-historical understanding of development, capturing teachers'
practical changes in a natural setting is what this study mainly looking for. Therefore, an
educational experiment (Hedegaard, 2008b) was used as a methodology to frame the study.
An educational experiment "implies a cooperation between researchers and educators" (p.
200) aiming to solve a theoretical problem within a naturalistic setting (Hedegaard, 2008b, p.
200). To support teachers' development in play, we introduce the Conceptual PlayWorld in
the EE. A Conceptual PlayWorld is a new pedagogy developed by Fleer (2018) based on the
successful implementation of the playworld (Lindqvist, 1995) in which teachers and children
collectively create an imaginary situation and solve problems using scientific concepts. The
Conceptual PlayWorld fits well in Chinese kindergarten context (Fleer & Li, 2020; Ma et al.,
2022). In addition, Lewis et al. (2019) presented research involving two teachers working
together to bring out a successful playworld in the Australian cultural context. The research
suggested the possibility of teachers engaging in a Conceptual PlayWorld as a team.
Therefore, the Conceptual PlayWorld is utilised in this study as an intervention to support
teachers' development in a Chinese cultural context.

4.1 Research Participates and Settings

This study was conducted in a public kindergarten located in a provincial capital city
of China. Two teachers Ms Li, Ms Han, and 34 children from class C (age group 4-5, mean:
4.65 years old) participated in this study. Both participating teachers obtained diplomas in
early childhood education from a teachers' college. Ms Li with 15 years of teaching

experience and Ms Han with three years of teaching experience, the two teachers had been working as a team in this class for four months. Pseudonyms were used in the study.

4.2 Procedure and Data Collection

There were three phases of the data collection using the method of digital video observation, interview, and focus group discussion. All three phases were documented, a total of 58.59 hours of data were collected for the study. As we have a researcher who was overseas and couldn't travel to China due to the outbreak of Covid-19, all the meetings with the teachers were organised online, to make sure all the participants actively participate in the study.

The first phase included baseline data collection, a professional development workshop, and a teachers' interview. For the professional development workshop (three hours in total), two sessions of workshops were organised to introduce the Conceptual PlayWorld approach to teachers and gave chance for the teachers to explore, discuss, and plan how to implement the Conceptual PlayWorld.

After the professional development workshop was conducted, we collected the baseline data aiming to capture teachers' daily practice before the Conceptual PlayWorld was implemented. Four sessions of the baseline data were collected (12.75 hours in total) using digital video observation. After the baseline data collection, a teachers' interview (0.4 hours) was conducted via zoom to understand how the activities were organised by the two teachers in daily practice and the basic information about the children within the classroom.

The second phase of the data collection included the focus group discussion and the Conceptual PlayWorld implementation. The focus group discussion was conducted collectively by the two researchers and the two teachers, aiming to provide the platform for

ongoing support for the two teachers to implement the Conceptual PlayWorld and for teachers' reflection on their practices. The Conceptual PlayWorld was conducted over two months. The researchers and teachers designed and planned the Conceptual PlayWorld following the five characteristics considering children's interests, and perspectives. First, select a story. A storybook named <*The whale and the sn*ail> by Julia Donaldson (2003) was selected to develop a Conceptual PlayWorld, which illustrated a story about a sea snail going out for an adventure with a big whale. Second, designing the imaginary spaces. As the story happened in the ocean, the imaginary situation was located in the ocean, where the sea snail and whale can have the adventure. Third, entering and exiting the PlayWorld. The sound of a horn was used as a sign to inform that teachers and children were entering or exiting the imaginary situation as characters in the story. Fourth, planning a problem to be solved. Different problem scenarios were brought out following the storyline for children to solve with the teachers within the Conceptual PlayWorld. Fifth, what roles will the teachers take in the Conceptual PlayWorld, the two teachers took different character roles in the play. Few focus points were considered by the researchers and teachers when choosing the different roles such as how the two teachers could support each other to bring out the problem situation or how the two teachers used their character roles to facilitate the teaching process.

The researchers were both researchers and participate in this educational experiment. As researchers, we always kept the aim of the research in mind within the research setting. As a participant, we planned and designed the activity together with the teachers and got involved in the activity to promote dramatic moments for children to solve problems. It was challenging for the researcher to capture the whole activity with one camera as a participant. Therefore, three cameras were used to video record the data, two roaming cameras were used to capture teachers and children respectively, and another still camera was used to capture the

whole situation. A total of 27.63 hours of digital data were collected during the Conceptual PlayWorld implementation.

The third phase was the post-interview with children and teachers respectively, aiming to understand the Conceptual PlayWorld implementation from different perspectives. Ethical approval was granted by the authors' university Human Research Ethics Committee, and informed consent was obtained from the participating kindergarten, teachers, and families before data collection. The summary of the research procedure and digital data is exhibited in table 1. Data highlighted in the table represents the data used in the study, including the baseline data, the implementation of the Conceptual PlayWorld, the focus group discussion and teachers' interviews.

Table 1.

Summary of digital video data collection

	Focus group discussion			Digital video observation		Interview		Total hours
	Between the researchers	Between the researchers and teachers		Baseline	Conceptual PlayWorld	Children's interview	Teachers' interview	
		PDW*	Focus group discussion					
Class C	5	3	3.46	12.75	27.63	5.75	1	58.59
Total hours	11.46			40.38		6.75		58.59

4.3 Data Analysis

The study used three levels of interpretation (Hedegaard, 2008c) for the data analysis to ensure the validity and stability of the data analysis. The three levels of interpretation (Hedegaard, 2008c) includes common-sense interpretation, situated practice interpretation, and thematic interpretation. At the common-sense interpretation, researchers repeatedly watched the data and documented our understanding of the daily practice in the kindergarten context from both teachers' and children's perspectives to get a holistic view of the daily practice. Then at the situated practice interpretation, we focused on the patterns of teachers' professional practices changes during the educational experiment, specifically, the two teachers' qualitative changes in the EE. Then at the thematic interpretation, the data were analysed with the theoretical concepts of the social situation of development to address the research question. For example, how the educational experiment provided a new social situation that motivated teachers' practical changes would be understood at this level. The three levels of interpretation was analysed in a continuing upward spiral way (Li, 2019) to make sure the data was interpreted in a valid way. To be specific, the researchers need to go back to the data and develop the patterns they found driven by taking the theoretical lens.

5 Findings

To answer the research question, this study focused on the practical changes in teachers' pedagogy when the Conceptual PlayWorld was introduced as a new social situation. The research findings were presented in table 2 to give an overview of teachers' practical changes as the Conceptual PlayWorld implementation over eight sessions, including the transformation of teachers' roles, teachers' relationships, and teachers' collaboration in play. Two typical vignettes of the two teachers' teaching were presented in the flowing sessions.

5.1 Vignette 1: One Teach, One Assist Approach

This vignette was selected from the 2nd time baseline data. The educational purpose of this activity was to teach the habit of fish. A story was told to promote children's discussion about whether fish need to be taken out from the pool when winter is coming. Ms Li was the teacher who led this session and directly told children fish cannot be taken out from the pool because fish can adjust their body temperature according to the temperature of the water. Ms Han was supporting this activity the whole time. In this session, she was standing at the back of the classroom and helping Ms Li manage the children's behaviours.

When the teachers were asked about their teamwork in concept teaching, both teachers valued collaboration in the kindergarten context. As Ms Li said

'Collaboration is really important. Sometimes she (Ms Han) knows what I'm about to do with eye contact. I think this is important for us to work in a kindergarten.' (C-FI-T)

In this session, the two teachers presented the teaching process as one teacher in the leading position and the other teacher offering support which is known as a "one teach, one assist" approach (Hsieh & Teo, 2021). Teachers took teacher roles in this activity. To be specific, Ms Li was taking the leading role in the collaborative teaching relationship. Ms Han took her role as an assistant teacher in this activity so that Ms Li could focus on her concept teaching. However, as vignette 2 is presented, the way of teaching has shifted as the Conceptual PlayWorld was implemented. Figure 1 & 2.

Figure 1

"One teach, one assist" approach

5.2 Vignette 2: Mutual support

The vignette selected from the 2nd session of the Conceptual PlayWorld implementation generally presents how both two teachers support children's science learning by taking character roles in the story and how teachers change their teaching practice.

The researchers and teachers had a focus group discussion before the second session of the Conceptual PlayWorld and planned the educational aim considering children's interests. The educational aim was to help children understand the differences between the snail and the sea snail.

Following the five characteristics of the Conceptual PlayWorld, the researchers and teachers planned the second session of the Conceptual PlayWorld during the focus group discussion. Ms Li reflected on her practice and said *'At the last (Conceptual PlayWorld) session I always call sea snail a land snail. Each time I made this mistake children would correct me. I think this is a great opportunity to explore the differences between sea snails and snails. It would be really interesting (C-2nd FGD).'* A new character was generated considering children's interests. Building on teachers' ideas, researchers proposed a dramatic problem to support children's learning. *For example, a sea snail can live in the water, however, a land snail cannot. This leads children to learn the concepts of pulmonary respiration and gill respiration.* This collective reflection and planning put demands on teachers to interact using their imaginary roles within the Conceptual PlayWorld.

The big whale (Ms Li) and little sea snails (children) came across a little snail (Ms Han) on a cliff.

Ms Li: Who are you?

Ms Han: I'm a little snail.

Ms Li: What are you doing here, little snail?

Ms Han: I want to go on an adventure with you all.

The big whale and little sea snails agreed that the little snail can join them. However, when they dived into the water, the snail called for help.

Ms Han: Oh no!! I can't go with you anymore!

Ms Li: Why? What is happening?

Ms Han: Because I cannot breathe under the water!

Ms Li (Big whale asking children): Oh no! What should we do? Should we find a way to help her?

Both teachers presented dual roles (Kravtsov & Kravtsova, 2010), teachers and players within this imaginary situation. Taking both roles, the two teachers worked closely together to dramatise a scientific problem for children to solve. This way of collaborative teaching is named the "mutually support" approach in this study. According to the teachers, the EE motivates teachers' practical changes in play.

Ms Li: Before the Conceptual PlayWorld, we always took the leading position even in play. Through the focus group discussion, we realised the importance of supporting children as a player and giving children chances to explore. Therefore, when we were playing together with children in the Conceptual PlayWorld, we tried to let children identify problems themselves. We find out children really like this, and we all

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participate as play partners in this situation. It is different from what we thought, and

we enjoyed this process. (C-FI-T)

Ms Han: When we were inside the Conceptual PlayWorld, we became the play

partners who contributed to the play. This makes children feel relaxed and get more

involved in the activity. (C- FGD(WeChat) -T)

Moreover, both teachers recognized the value of this new practice and how it benefits

children.

Ms Li: Normally in our traditional class, one teacher would take the lead and the

other one would coordinate this process. However, within the Conceptual PlayWorld,

we need to collaborate and participate in imaginary play with children. This way of

teaching allows us to create a richer knowledge-learning environment for children,

additionally, as teachers, we can learn from each other and improve together.

(C-FGD(WeChat) -T)

Figure 2

"Mutually support" approach

The findings present how the two teachers changed their teaching practice in response

to the new demand from the educational experiment. As expected, we found in the baseline

data that the teachers' roles were as educators in the *one teach one assist approach (Hsieh &*

Teo, 2021). However, the EE created a new social situation and put demands on teachers to

change their roles in practice. In addition, the relationship between the two teachers also

changed. In the Conceptual PlayWorld, the two teachers mutually support each other following the characteristics of the roles they took in the story.

Table 2.

The transformation happened in the educational experiment

	Baseline			The Conceptual PlayWorld Implementation							
Session	1st session	2nd session	3rd session	1st session	2nd session	3rd session	4th session	5th session	6th session	7th session	8th session
Teaching content	Drawing activity- My dad	Scientific learning – The habitat of fish	Block activity – Construct building	The sea storm	Helping little snail	Finding a seat	Is the boat full?	Saving the big whale	Making a boat	Testing the boat	Submarine design
Teachers' roles	Educators			Educators and play partners							
Relationships between teachers	Real relationship			Real relationship and play relationship							
The way of collaboration	"One teach, one assist" (Hsieh & Teo, 2021)			Mutually support							

6 Discussion

The findings suggest that the EE created developmental conditions for teachers' qualitative practical change and motivated the development of their collaborative teaching. The focus group discussion with researchers and the Conceptual PlayWorld implementation showed how the teachers' qualitative practices changed and developed as a dynamic team.

6.1 The Collective Reflection on Teachers' Play Pedagogy

Providing ongoing support for teachers is one of the important factors to conduct an effective PD (Brenneman et al., 2019; Sakin, 2020; Guo et al., 2022). The focus group discussion in this educational experiment provides continual support for teachers' science teaching in play. In the first session of the CPW, Ms Li was confused with sea snail and snail and was corrected by the children several times. This tension in teaching inspired teachers to develop a new role to support children's science learning in play during the collective reflection. Teachers are creating an imaginary situation for children by introducing the new role. However, a playful imaginary situation is not enough for the teachers to meet the 'teaching in play-based policy demand'. Therefore, the researchers motivate teachers to integrate concepts teaching in the play-based situation. Based on the new role that teachers created the researchers supported the teachers to integrate scientific concepts in play, to support children's learning. The collective reflection creates conditions for researchers and teachers to build on each other's thoughts and work together to motivate teachers' practical change as a team. In summary, the focus group discussion in EE works as a motivating force for teachers to teach science concepts using their imaginary roles. The ongoing support from the researchers responds to the requirement of conducting an effective PD in the Chinese context (Guo et al., 2022) and supporting teachers to develop as a team to meet the policy requirement (Ministry of Education, 2012).

6.2 The Collective Imaginary Situation Motivates the Change in Collaborative Teaching

The Conceptual PlayWorld created a collective imaginary situation for teachers to teach in a play-based setting which supports teachers' content knowledge development in practice. Positioning themselves in imaginary roles, teachers developed a new way of

collaboration within the collective imaginary situation. Kravtsov and Kravtsova (2010) suggested that players present dual roles within the imaginary play. They were both "situational and supra-(above) situational" at the same time within the imaginary play (p. 29). The relationship between teachers has changed from real relations to dual relations. They were both play partners and colleagues simultaneously.

Teachers needed to orient themselves to different play roles as play partners, so that the play can be continued (Kravtsov & Kravtsova, 2010). The roles that teachers were taking in play brought rules for teachers to follow as players (Vygotsky, 1966). For example, the character of the big whale was full of compassion and willingness to help others. The play role motivated Ms Li to offer help and interact with Ms Han within the collective imaginary situation. The relation between the imaginary roles motivated the two teachers to develop a new way of collaboration within the collective imaginary situation. They mutually support each other in dramatising and exploring the conceptual problem so that children were engaged and took initiative in concept learning. Meanwhile, they were also colleagues holding the teaching agenda to support children's scientific learning. The double subjectivity in play gives possibilities for teachers to transit between their relationships in play to support children's learning (Fleer, 2019). In conclusion, the collective imaginary situation within a Conceptual PlayWorld gave teachers the possibility to develop a new way of collaboration.

6.3 The Educational Experiment Creates Developmental Conditions for Teachers

As teachers mentioned that by taking roles in the play, a relaxed and playful social situation is created for children to get more involved and actively find different solutions to help the little snail in the activity. A very different developmental condition for children's development was created when adults were a part of children's play (Fleer, 2019). The EE created a new social situation and put demands on teachers to change their motive orientation

when supporting children's scientific learning. From a didactic approach to use the imaginary roles to support science learning. According to the argument that the development of cultural age was indicated by the change of motive orientation. The current study proposed that EE created developmental conditions for teachers' science teaching in play.

The EE works as a source that motivated teachers' professional development through collective reflection and practice (Li et al., 2022). The focus group discussion motivates teachers to reflect on their practice and worked as a motivating force for teachers' professional development in science concept teaching in play. The new social situation of the CPW brought out teachers' professional development in relation to the social interactions with each other and the children as they became characters in the story narrative. According to Bozhovich (2009), the social situation of development was not only in relation to the social environment but also related to how teachers interpret the situation. The developmental condition that an EE created was in line with teachers' developed motives. As Ms Li mentioned in the interview, *collaboration in the kindergarten context is really important.* Teachers' personal motive orients them to collaborate within the new social situation. Therefore, teachers' collaborative teaching development was realised as they positioned themselves as collaborators in play when supporting children's science learning.

The genetic law of development (Vygotsky, 1997) illustrates that an individual's development starts from the social interaction between people, and then becomes internalised to serve an individual's development. In this study, teacher development starts from the interaction between researchers and teachers, then internalised the teaching practice. The focus group discussion and CPW implementation support teachers' development in a dynamic way in the educational experiment, as presented in figure 3.

Figure 3

7 Conclusion

The expectation from Chinese early years policies put demands on kindergarten teachers to develop their play pedagogy (Ministry of Education, 2001, 2012). However, this is challenging work for Chinese kindergarten teachers (Qiu, 2011; Wu & Rao, 2011). To contribute to filling the gap in how to do this, this study conducted an EE to understand how the new conditions change teachers' professional practice and conceptualisation of play pedagogy for teachers.

The findings of the study suggested that the EE created a new social situation that motivates teachers' development in collaborative teaching. The new way of collaboration on the one hand can better support children's learning in play. On the other hand, the collaboration provided a chance for both teachers to actively participate and contribute their expertise in science teaching. Therefore, this study argued that EE is an effective PD that worked as a source for teachers' play pedagogy development.

The study is limited because the conclusion is based on two teachers from one Chinese kindergarten located in Jilin Province. However, the EE informs a possible way of supporting Chinese kindergarten teachers' play pedagogy development in the Chinese kindergarten context. Further study is needed to investigate if EE can support more teachers' professional development in concept teaching in play.

Great thanks to the preschool where this study was conducted, the participants, as well as XXX for supporting the data collection.

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