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**Research on Refining the
Kindergarten Physical Education Curriculum
Underpinned by Fostering Preschoolers'
Physical Literacy in China**

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Declaration of Originality

I, DUAN Liqiong (Student ID Number 80068434) declare that this dissertation entitled “ Research on Refining the Kindergarten Physical Education Curriculum underpinned by Fostering Preschoolers’ Physical Literacy in China” submitted as partial requirement for Ph.D. study program of Education is my original work and that all the sources in any form (e.g. ideas, figures, texts, tables, etc.) that I have used or quoted have been indicated and acknowledged in the text as well as in the list of reference.

Signature:_____

Date:

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Abstract

Physical literacy is defined as the motivation, confidence, physical competence, knowledge, and understanding that provide preschoolers with the foundation for lifelong participation in physical activity. The preschool stage is the initial stage of the development of children's physical literacy. Kindergarten physical education is a crucial way to foster preschoolers' physical literacy. Constructing a systematic physical education curriculum aiming at fostering preschoolers' physical literacy can help promote the reform of kindergarten physical education curriculum, improve the quality of kindergarten physical education, lay a solid foundation for preschoolers' physical literacy development, provide a model for developing kindergarten physical education curriculum, and expand the concept to a more diverse cultural environment.

Based on Taylor's "Objective Model" and movement development theories, a systematic kindergarten physical education curriculum was constructed according to the dynamic process of the ABC model. Quantitative methods and qualitative methods were used together. Documentary analysis, interview, and observation were employed to construct a systematic physical education curriculum underpinned by fostering preschoolers' physical literacy in SUN kindergarten in China, to reveal the features of each curriculum components. Then a quasi-experiment was carried out to show the effect of the new curriculum on preschoolers and teachers. Three stages of the study and the results are as follows:

The first stage is to describe the old physical education curriculum in the kindergarten. The results indicate that the old physical education curriculum in the kindergarten is imperfect and the components of the physical education curriculum are vague.

The second stage is to construct a systematic physical education curriculum based on the old one. The results indicate that the kindergarten physical education curriculum underpinned by fostering preschoolers' physical literacy is a system of five interrelated components. Specifically :

(1) The curriculum philosophy contains three parts including the value of physical activities, the goal of PE, and the duties of different stakeholders, to guarantee the environment of fostering preschoolers' physical literacy in kindergarten.

(2) The curriculum goals focus on three dimensions of physical literacy, which are delineated from physical competence, affective, and cognitive parts in detail.

(3) The curriculum content is selected based on the three dimensions of the goals and originate from preschoolers' movement experiences.

(4) The curriculum implementation emphasizes the principle of creating a mastery motivational climate in relation to TARGET class structure to achieve maximum teaching and effective learning.

(5) The combination of formative evaluation and summative evaluation is an effective strategy evaluating preschoolers' physical literacy development.

The third stage is to do a quasi-experiment to show the effect of the new physical education curriculum. The results indicate that the new curriculum has a positive effect on preschoolers' development and teachers' development. Specifically :

(1) Preschoolers in the experimental group made significant progress in physical fitness development in total, especially in the dimensions of Horizontal jumping, Throwing, and Balancing.

(2) Preschoolers in the experimental group made significant progress in basic motor competencies development of Object control and Self-movement, especially in the dimensions of Catching, Rolling, Throwing, and Dribbling.

(3) Preschoolers could not make accurate judgments about their physical competence.

(4) Class teachers in the experimental group made significant progress in making accurate judgments about preschoolers' physical competence in total, especially in dimensions of Tying shoelace, Climbing, Running, and Skipping.

(5) The PE teacher in the experimental group made progress in professional development in three dimensions.

Keywords: Physical literacy, Physical education, Physical education curriculum, Kindergarten, Preschooler.

Chinese abstract

体育素养(Physical literacy)是指为儿童终身参与体育运动打下基础的动机,自信,运动能力,知识和理解。学前阶段是幼儿体育素养发展的初始阶段,幼儿园体育是培养幼儿体育素养的重要手段。系统构建以培养幼儿体育素养为目标的体育课程有利于推动幼儿园体育课程改革,提高幼儿园体育的质量,为幼儿体育素养的发展奠定坚实的基础,为其他幼儿园体育课程的发展提供借鉴,同时促进体育素养研究的多元化发展。

本研究从以泰勒的“目标模式”为课程构建的依据,以动作发展理论为基础,根据 ABC (Achievement-Based Curriculum) 模式的动态过程构建系统的幼儿园体育课程。研究采用定性和定量相结合的方式,运用文本分析法,访谈法和观察法在 SUN 幼儿园系统构建以培养体育素养为目标的幼儿园体育课程,揭示各课程要素的特点,再通过准实验研究探讨新构建的课程对儿童和教师发展的影响。研究的三个阶段及其研究结果如下:

第一阶段是描述该幼儿园旧的体育课程。结果表明目前该幼儿园的体育课程不完善,体育课程要素不清晰。

第二阶段是基于原有体育课程构建新的体育课程。结果显示构建的以培养幼儿体育素养为目标的课程包含五个相互联系要素体系。具体而言:

(1) 课程理念包含三个部分,分别是体育活动的价值,体育的目标和不同利益相关者的责任,以确保幼儿园提供培养幼儿体育素养的环境。

(2) 课程目标关注体育素养的三大维度,分别从身体能力(physical competence),情感和认知三部分详细描述。

(3) 课程内容围绕课程目标的三大维度选择,贴近幼儿的运动经验。

(4) 课程实施强调营造与 TARGET 相关的掌握导向的课堂氛围的原则,以实现最大限度地教和有效地学。

(5) 课程评价采用形成性评价与总结性评价相结合的策略,以有效评价幼儿体育素养的发展。

第三阶段是进行准实验,以揭示新体育课程的效果。结果显示新的幼儿园体育课程对幼儿和教师的发展都有积极地影响。具体而言:

(1)实验组的幼儿在身体素质发展方面取得显著提高,特别是在立定跳远,投掷和平衡三个维度表现显著。

(2)实验组的幼儿在基本运动技能发展方面取得显著提高,特别是在接球,前滚翻,投球和带球四个维度表现显著。

(3)实验组幼儿不能对自己的运动技能进行准确地判断。

(4)实验组的班级教师对幼儿运动技能进行准确判断的能力显著提高,特别是在系鞋带,攀爬,快速跑和连续垫步跳四个维度。

(5)实验组的体育教师在幼儿园教师专业发展的三个维度都获得了发展。

关键词: 体育素养, 体育, 体育课程, 幼儿园, 幼儿。

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Chapter 1 Introduction

1.1 The rationale for the research

Kindergarten curriculum reform is one of the core reforms in preschool education in China now. The fundamental purpose of the kindergarten curriculum reform is to solve the core problems in it and promote preschoolers' development. Kindergarten physical education (PE) curriculum is the most essential part of the kindergarten curriculum, which can significantly affect preschoolers' physical fitness and physical activities. It is imperative to reform the kindergarten PE curriculum for the following reasons.

1.1.1 Children are threatened by obesity because of the decline of physical activity

Throughout the developed world, there is an increasing prevalence of childhood obesity, along with adults. It was urgent to offer effective physical activity programs to stop the spread of obesity around the world (Salmon et al., 2007). The number of overweight or obese children has risen dramatically around the world, such that 6.7% of children under five are overweight with an estimated 9.1% by 2020 (Onis et al., 2010). *The Report on Childhood Obesity in China* (Ma et al. 2017) pointed out that the overweight and obesity rate of children in China was continuously rising. There were 4.76 million obese children aged from 0 to 7 years in major cities in China, and overweight and obese children over the age of 7 were 34.96 million, adding up to nearly 40 million. Moreover, if effective interventions are not adopted, the number of the obese children aged from 0 to 7 years will increase to 6.64 million by 2030, and the overweight and obese children aged 7 and over will increase to 49.48 million.

The amount of physical activity is strongly associated with obesity. In many countries, including the United States, physical activity among youth had declined in recent years, and the corresponding increase in obesity prevalence might be the direct result of physical activity decline (Luepker, 1999). Liukkonen (2016) pointed out that overweight and obesity were a significant cause for health risks, sedentary behavior,

and relevant bad habits significantly caused weight gain in children Gutin et al. (2002) reported that an increase of physical activity resulted in a decrease in body weight, especially in overweight children and adolescents. There is evidence that obesity, inactivity and physically active may all track from early childhood to adulthood (Oliver et al., 2007) and researchers have begun to focus on the importance of physical activity in the preschool years (Oliver et al., 2007, Vidoni & Ignico, 2011). Physical education (PE) plays a critical role in laying a solid foundation for children to take an active part in physical activities in their whole life.

1.1.2 Physical literacy is incorporated into physical education to help children be physically active

Whitehead founded the concept of physical literacy systematically in 2001 to aid the global obesity and sedentary crisis clouding the developed world (Tompsett et al., 2014). Physical literacy was defined as “the motivation, confidence, physical competence, knowledge, and understanding to maintain physical activity throughout the life course” (Whitehead, 2001, p. 45). Physical literacy (PL) is now being embracing around the world step by step. Ten countries have engaged in-depth research and practice on it, seven of them ranked within the top 25 for obesity prevalence. These countries advocate physical literacy and incorporate components of physical literacy into their policies and physical education (Spengler, 2015). They have got fruitful achievements and can provide valuable experiences to other countries. In different countries, physical literacy was taught and developed through physical education, organized sport, and active play (Spengler, 2015). The relationship between physical literacy and physical education was that “physical education was a subject area in the school curriculum while physical literacy was the goal of physical education” (Whitehead, 2013b, p. 32). Roeterta et al. (2014) declared that the outcome of a quality PE program was a physically literate young person, who had the skills, knowledge, habits, confidence, and desired to continue participation in physical activity throughout the lifespan (p. 39).

1.1.3 Physical education in kindergarten is one of the most critical factors to influence preschoolers' physical literacy

Early childhood is a crucial period to foster children's PL. Gallahue noted that children's physical literacy was naturally developed with the development of fundamental movement skills (FMS) from infancy with most movement skills reaching maturity around five to seven years (Gallahue et al., 2006). Fundamental movement patterns were the essential elements in movement competency for PL, which were the foundation for more specific movement skills (Murdoch et al., 2013). People who have developed a strong foundation in FMS are more likely to be physically active during childhood even later in life (Okely et al., 2001). Tompsett (2014) also pointed out that FMS was the determinant of a child's motor abilities and physical literacy. During early childhood, quality physical activities offered for children will lay a solid foundation for them to develop their PL.

Kindergarten PE is one of the critical ways to offer appropriate physical activities for children. Kindergarten teachers have duties to foster preschoolers' physical literacy in preschool years. In China, most of the children spend almost 9 hours in kindergarten per day from Monday to Friday. A systematic PE curriculum is a critical means to guarantee the quality of physical activity in kindergarten and help children develop their PL. However, there exist problems in the current PE in kindergarten in China. As research showed that PE in kindergarten was unscientific, and the goal of PE was not clear. 62% of kindergartens did not have a unified goal of PE; 65% of teachers did not know the goal of PE and designed the curriculum randomly (Liang et al., 2015). These problems are common in kindergartens in China; they have badly influenced the improvement in the quality of PE and have hindered the development of preschoolers' physical literacy.

1.1.4 The kindergarten physical education curriculum in Chengdu need to be refined

Kindergarten teachers¹, especially PE teachers, play a crucial role in constructing the PE curriculum. They are not only the performer of the curriculum but also the decision makers and designers of the curriculum, and they are indeed the researcher of the curriculum (Yu, 2001). Unfortunately, kindergarten teachers lack the knowledge of curriculum construction, professional knowledge of PE, and skills of PE in Chengdu in China. Most of them are struggling in refining the kindergarten PE curriculum and experiencing low self-efficiency. Kindergarten teachers are trying to construct their kindergarten-based PE curriculum. However, they put much time on curriculum implementation and neglect the other parts of the curriculum. Most of the kindergartens do not have a systematic PE curriculum after many years, and teachers are trying to work on their experience. It is critical to instruct kindergarten teachers to refine kindergarten PE curriculum purposefully, and offer quality PE curriculum for preschoolers to help them become physically active in the whole life.

The situation of the kindergarten PE curriculum in SUN kindergarten is much the same as in many other kindergartens in Chengdu, even in China. Researchers should solve the problems from a systematic perspective, considering the difficulties by taking the goal, the content, the implementation, and the evaluation components as a whole. The first and foremost important thing is to make sure what is the goal of the PE curriculum in kindergarten. Refining the current kindergarten PE curriculum from a systematic perspective has become an essential and imperative thing in the current situation of China.

1.2 Research purpose

In the new Times, significant changes have happened on children, the subject knowledge, and the society in China. Preschoolers' interest in physical activity is declining, and their physical fitness is going down, especially in cities in China.

¹ Kindergarten teachers are classified into class teachers and PE teachers. Class teachers organize different activities for children in their classes, and PE teachers only organize physical fitness class for different classes.

Preschoolers' FMS develops unevenly. Preschoolers' need for physical activity inside or outside of kindergarten is becoming urgent. Teachers play an active role in constructing quality PE curriculum in kindergarten. Researches about children's motor development are getting deeper and deeper in China. The State Council proposed to carry out preschoolers' physical education (National Fitness Program for 2016—2020, 2016). All these changes call for a high-quality PE to foster preschoolers' physical literacy and enable them to take an active part in physical activities now and later in life.

In light of the nature of the current situation of the kindergarten PE curriculum and the nature of children's motor development, it is necessary to reform the PE curriculum in kindergarten. This study aimed to develop a new PE curriculum and explored the features of a systematic PE curriculum which was refined underpinned by fostering preschoolers' physical literacy in China. The specific objectives are as follows:

1. To explore the specific goals of kindergarten PE curriculum which focus on preschoolers' physical literacy.
2. To explore the content of kindergarten PE curriculum which can improve preschoolers' physical literacy.
3. To explore the pedagogical principles which can foster preschoolers' physical literacy in the teaching process.
4. To explore the strategies which can effectively evaluate preschoolers' physical literacy development and curriculum development.
5. To show if the new PE curriculum can significantly improve preschoolers' physical literacy development.

1.3 Research questions

To achieve the above objectives, the study focuses on the following research questions.

1. What are the features of the new kindergarten PE curriculum underpinned by fostering preschoolers' physical literacy?

(1) What are the specific goals of kindergarten PE curriculum which focus on preschoolers' physical literacy?

(2) What is the content of kindergarten PE curriculum which can improve preschoolers' physical literacy?

(3) What are the principles which can effectively foster preschoolers' physical literacy in the teaching process?

(4) What are the strategies which can effectively evaluate preschoolers' physical literacy development?

2. How does the new kindergarten PE curriculum work?

(1) What is the positive effect of the new kindergarten PE curriculum on preschoolers?

(2) What is the positive effect of the new kindergarten PE curriculum on kindergarten teachers?

1.4 The significance of this research

Most kindergarten teachers cannot describe goals of PE clearly in kindergartens in China. It is a big problem that hinders kindergarten teachers for designing their kindergarten-based PE curriculum. This study will try to take physical literacy as the goal of PE and try to discuss the specific objectives need to be achieved in K3². This job will make the goals of PE in an observable and a whole way which can be understood by kindergarten teachers clearly. The results can guide kindergarten teachers to design and organize appropriate physical activities in their kindergarten easily.

This research took place in SNU kindergarten which had normal conditions as many other kindergartens in Chengdu, China. It describes the process of constructing a systematic kindergarten PE curriculum. The research process and outcomes can be used as a reference by other kindergarten teachers to construct a systematic PE curriculum in Chengdu or in other places.

² K1, K2, K3 are symbols used in this study, they represent different ages of preschooler's class, children of 3-4 years are in k1, children of 4-5 years are in k2, children of 5-6 years are in k3.

The concept of physical literacy has been embraced by European countries, the United States, Australia, Canada and so on, whereas, in China, it is the first trial to take it into the kindergarten PE curriculum. This research will expand the concept to a more diverse cultural environment.

1.5 The theoretical framework

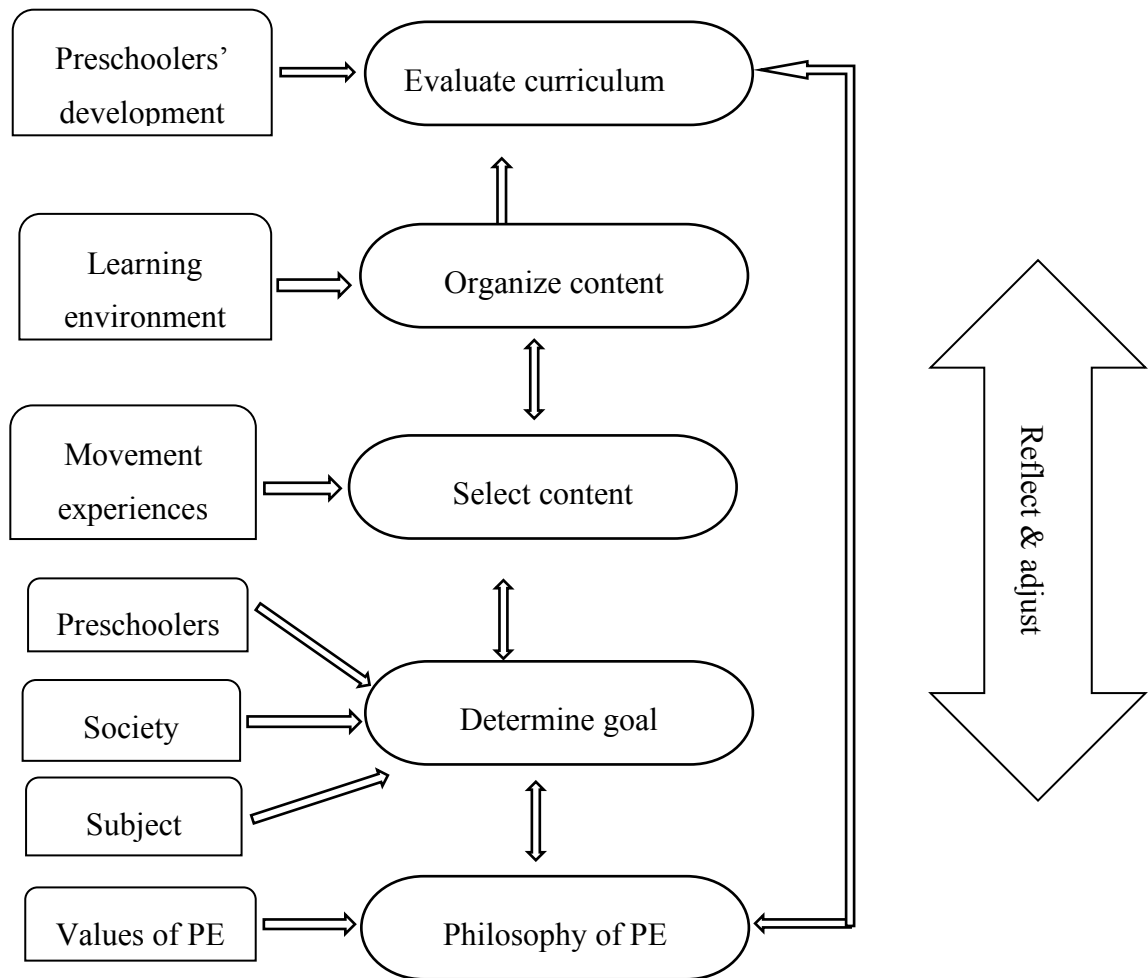
In the field of curriculum development research, Tyler (2015) identified four fundamental questions which must be answered on developing any curriculum and plan instruction (p. 51) :

1. What educational purposes should the school seek to attain?
2. What educational experiences can be provided that are likely to attain these purposes?
3. How can these educational experiences be effectively organized?
4. How can we determine whether these purposes are being attained?

The answer to these four questions came to be the curriculum development model which was called “Tyler Principles.” It had a far-reaching influence on the later curriculum research. It had a logical curriculum development framework and has important practical significance (Kelly, 2009). After Tyler’s theory was put forward, many scholars continued to follow Tyler’s direction to interpret the “Taylor Principles” as a curriculum development model of how to operate, and gradually formed the “Objective Model” of curriculum development: determining goal - selecting content - organizing content - evaluating curriculum.

In this study, the “Tyler Principles” was followed to develop the new PE curriculum. Figure 1.1 showed the process of PE curriculum development in this study. It began with a philosophy about the purpose of PE. Values stated in philosophy lead to the goal of PE. The goal was determined according to the needs of preschoolers, the needs of the society, and the needs of PE. Appropriate content from preschoolers’ movement experiences was selected to achieve the goal. The effective learning environment was created to organize content. Preschoolers’ development is a strong proof to show if the goal is achieved. Constant reflection and adjustment ran through the whole process

Figure 1.1 The process of curriculum development



1.6 Key concepts from different perspectives

1.6.1 Kindergarten

Kindergarten is an institution that carries out childcare and education for preschoolers over the age of three years. Preschool education is an integral part of elementary education and is the primary stage of the school education system (Ministry of Education, 2016). Normally preschoolers aged from 3 to 6 years study in kindergartens in China.

1.6.2 Curriculum

The word “curriculum” in the began as a Latin word which means “a race” or “the course of a race”, which in turn derives from the verb “currere”, meaning “to run/to

proceed” (Oxford English Dictionary). Its Grecian origins drive the discussion about the concept of the curriculum. There are more than one hundred kinds of definitions about curriculum until now. Different researchers make different definitions of the curriculum according to their academic background, theoretical framework, the perspective of the problem, and analysis methods.

The International Encyclopaedia of Curriculum published in 1991 was an important and more representative text of curriculum research. It offered lists of nine representative curriculum concepts (Connelly et al., 2004, p. 5-6):

- The curriculum is a series of possible experiences established in the school. The purpose is to train children and young people in groups to think and act in groups. (Smith et al.,1957)
- The curriculum is the full experience of the learner under the guidance of the school. (Foshay, 1969)
- The curriculum is the overall plan and specific teaching materials offered by schools, to enable students, obtain qualifications for graduation, to obtain certificates or enter professional fields. (Goode & Good, 1959)
- The curriculum is a methodological exploration and it includes teachers, students, subjects, social environment, etc. that are constituent elements of the discipline. (Westbury & Steimer, 1971)
- The curriculum is the life and plan of the school. It is a career that guides life and is formed the flow of activities for generations after generation. (Rugg, 1947)
- The curriculum is a learning plan. (Taba, 1962)
- The curriculum is planned, guided learning experiences and expected learning outcomes through the systematic organization of knowledge and experience (Tanner & Tanner, 1975)
- The curriculum must include at least five major disciplines: mother tongue, mathematics, science, history, and foreign languages. (Bestor, 1955)
- The curriculum is an ever-expanding thinking model about human experience and is a model in which a conclusion called truth is established and used as a background. (Belth, 1965).

In China, there are different kinds of definitions about curriculum in three common literature. In “Ci Hai” (1979): The curriculum is the “process of schoolwork.” In a broad sense, the curriculum refers to the scope, structure, and procedure of educational content determined to achieve the training objectives of schools at all levels and in all types of schools. In a narrow sense, the curriculum refers to a discipline set in the teaching plan.

In Encyclopedia of China, Education (1985): “The curriculum is the schoolwork and process, in a broad sense, it refers to the sum of all subjects (teaching subjects) or the total sum of students’ activities under the guidance of the teacher. In a narrow sense, it refers to discipline”. In the Comprehensive Dictionary of Education (Gu, 1998, p. 892) : “ The curriculum is the title of the educational content chosen to achieve the goals of school education. Chinese scholars also give different definitions of the curriculum.”

Shi (1996) summed up and analyzed six typical curriculum definitions: The curriculum is a teaching subject. The curriculum is planned for teaching activities. The curriculum is expected learning results. The curriculum is learning experiences. The curriculum is a social transformation.

Although there were various definitions of curriculum came from different scholars and there were four categories in total (Wiles, 2009; Wang, 2010; Yu, 2014):

- The curriculum is subject: the curriculum is the teaching subjects or the sum of teaching subjects.
- The curriculum is a plan: the curriculum is a kind of plan tied to goals and relative objectives.
- The curriculum is activity: the curriculum is not only teaching subjects but also includes the school activities and the progress and arrangement.
- The curriculum is experience: the curriculum is the totality of student experiences that occur in the educational process.

In summary, all the definitions about the curriculum offered different angles to understand the nature of the curriculum from different angles. The concept of

kindergarten curriculum derives from them. In this study, the curriculum was defined as a plan which tied to goals and relative objectives.

1.6.3 Kindergarten curriculum

Kindergarten curriculum belongs to the curriculum system, but it is different from other ages' curriculum. An American specialist named Bernard Spodek regarded preschool curriculum as a form of organized experiences provided by teachers for children in the kindergarten (as Cited by Yu, 2014). In England, *the Basic education curriculum guide (3-5)* showed that curricula were all the things children to do, to see, to listen, and to feel in the institution, including the content which are planned or unplanned. In a broad sense, there are four typical categories of definitions about the kindergarten curriculum in China. Firstly, the curriculum was a subject. Kindergarten curriculum was the kindergarten's overall education or the content of a subject, teaching process and schedule (Lu, 1991). Secondly, the curriculum was an activity. Kindergarten curriculum was the sum of the activities which occurred in the educational environment and aimed at promoting the full and harmonious development of children's physical and mental development (Feng, 1997). Thirdly, the curriculum was experience. Kindergarten curriculum was the comprehensive and useful experiences which were selected, organized, and offered purposefully according to the physical and mental development of children and the specific social culture background (Yu, 2001). Finally, now there was a tendency to define the kindergarten curriculum as experiences and activities. "Kindergarten curriculum is the sum of various activities that teachers make full use of the kindergarten's curriculum resources to help children achieve valuable learning experiences and to achieve kindergarten's educational goals" (Yu, 2014). In a narrow sense, in this study, kindergarten curriculum is a plan which tells what preschoolers will learn, how preschoolers acquire that learning, and how preschoolers' learning is verified.

1.6.4 Kindergarten-based curriculum

The kindergarten-based curriculum is derived from the school-based curriculum. Ministry of Education (2001) advocated a national level, local government level, and

school level curriculum management system in the *Basic Education Curriculum Reform Outline*. The kindergarten curriculum follows the pattern of three-level management. Ministry of Education (2001) promulgated *Teaching Guideline for Preschool Education* which stipulated the overall education goals, the fields of educational content and the principles of implementation, then the local education administrative departments gave specific guidance, and kindergartens determined their specific curriculum and teaching methods based on it and the guidance of the local education administrative departments. It means that kindergartens have the right to develop their kindergarten curriculum. That is to say, the kindergarten PE curriculum is the kindergarten-based curriculum.

1.6.5 physical activity

Physical activity was defined as “any bodily movement produced by skeletal muscle that resulted in a substantial increase over the resting energy expenditure” (Bouchard & Shephard, 1994).

1.6.6 Physical literacy

In this study, according to Whitehead’s definition, physical literacy was defined as the motivation, confidence, physical competence, knowledge, and understanding that provided preschoolers with the foundation for lifelong participation in physical activity.

1.6.7 kindergarten physical education

In a broad sense, PE is a complex socio-cultural phenomenon. According to the laws of human development, skill formation, and function improvement. It takes physical and intellectual activities as the primary means, it was a conscious, purposeful, and organized social activity, which could promote the overall development of a person, could improve physical competency and overall education levels, could enhance physical fitness and change lifestyle and improve the quality of life (Yan, 2000). PE is a part of the general culture of society, including school physical education, competitive sport, social sport. In a narrow sense, PE is school physical education. It is a purposeful

and planned educational process that employ physical activities to enhance physical fitness, to impart physical exercise knowledge, skills, and techniques to cultivate moral and willpower quality. It is an integral part of education and a meaningful way to cultivate a whole person (Introduction to the Sports Team, 2013).

PE has similar concepts in other countries. In Canada, PE is a school subject designed to help children and youth develop the skills, knowledge, and attitudes necessary for participating in active, healthy living (PHE Canada) . In American, PE is a curricular area offered in K–12 schools that provides students with instruction on physical activity, health-related fitness, physical competence, and cognitive understanding about physical activity, thereby enabling students to adopt healthy and physically active lifestyles (NASPE, 2008). Typically, PE is one of an independent subject in the school system. In England, “ PE refers to that area of the school curriculum concerned with developing students’ physical competence and confidence, and their ability to use these to perform in a range of activities” (Department for Education and Employment, 2000).

The definition of kindergarten PE comes from school PE. Though there are no strict subjects in kindergarten, PE is one of the essential parts of education in promoting children’s physical fitness and health in kindergarten. Kindergarten PE refers to the series of meaningful educational activities which are organized in kindergarten , designed following the laws of the development of preschoolers, and organized with scientific methods to enhance the physical fitness of preschoolers, and ensure the health of children (Li, 1999).

In this study, Kindergarten PE refers to a series of meaningful educational physical activities which are organized according to the kindergarten environment, following the rules of preschoolers’ physical and mental development, and adopting scientific methods to foster preschoolers’ physical literacy.

1.6.8 Kindergarten physical education curriculum

From the definitions of PE and curriculum, the kindergarten PE curriculum is defined as a systematic plan (program) which is designed according to the kindergarten environment, follows the kindergarten's philosophy and the rules of preschoolers' physical and mental development, contains clear goals, appropriate content, pedagogical principles and evaluation strategies, aiming to foster preschoolers' physical literacy. The kindergarten PE curriculum differs from ages to some extent. In this study, the PE curriculum for children aged from 5-6 years will be explored mainly.

1.7 Outline of the dissertation

There are five chapters in this dissertation. Chapter 1 introduces the rationale of the research, research significance, research purpose, research questions, and the key concepts from different perspectives. Chapter 2 explores existing literature and research relevant to this study to set the theoretical foundation and context for the study and the generation of the research questions. Chapter 3 outlines the methodology of the study. The rationale for mixed methods was explained. Specific research methods such as observation, interview, documentary analysis, and a quasi-experiment were employed in this research in three stages. Chapter 4 presents the results by analyzing qualitative data and quantitative data obtained in the research process to answer the research questions, respectively. Chapter 5 discusses the results of data, draw the conclusions, point out research limitations, and put forward the future research ideas.

Chapter 2 Literature review

The purpose of this chapter is to explore existing literature and research relevant to this study. The literature and research discussed here set the context for the study and the generation of the research questions as identified in the previous content. Therefore, the theoretical foundation, the current situation of kindergarten PE curriculum in China were revealed clearly, which included the goals of kindergarten PE curriculum, the content of kindergarten PE curriculum, the implementation of kindergarten PE curriculum, the evaluation of PE curriculum, and the design of the PE curriculum. The kindergarten PE curriculum in other countries is also mentioned.

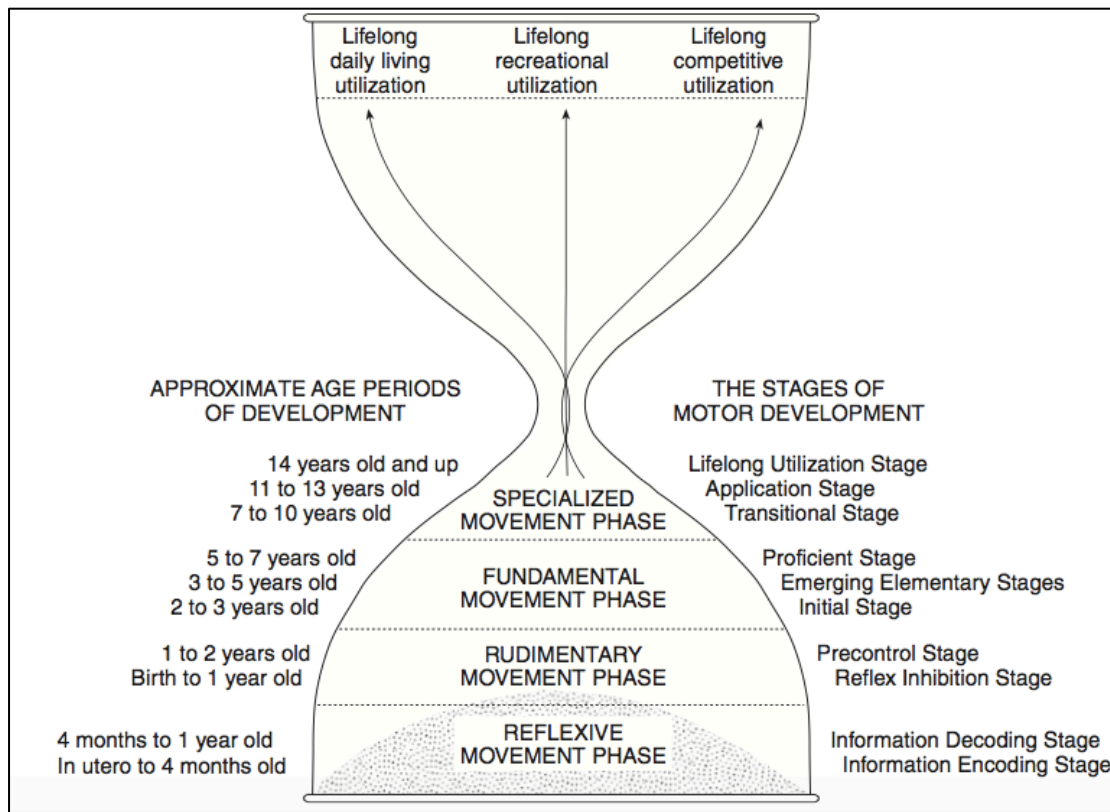
2.1 The theoretical foundation

Theories should undergird the study of children's motor development and PE curriculum development. Gallahue et al. (2012) claimed that understanding the process of motor development helped explain how movement skill learning occurs, which was crucial to developmentally appropriate instruction. Payne & Isaacs (2017) also noted that “knowledge of motor development was needed to the creation of valid, efficient, and science-based programs for teaching movement skills and the development of effective interventions strategies for people of all ages” (p.84). The movement development theories involved phase stage theory, which told what people were typically like at particular age periods, and dynamical systems theory, which told why these characteristics occurred (Gallahue et al., 2012). These theories show the laws of movement development and offer the foundation for designing and implementing the PE curriculum. Physical literacy is involved as the goal of the PE curriculum in this research. The achievement-based curriculum (ABC) model offers a dynamic process to construct a systematic PE curriculum.

2.1.1 The phase stage theory

The phase stage theory describes the process of motor development, which contains four phases sequential progression of movement skills throughout the entire life span (Gallahue et al., 1997).

Figure 2.1 The phases of motor development (Gallahue & Ozmun, 1997, p. 81)



As Figure 2.1 shows, the first phase is the reflexive movement phase in which infants use involuntary movements to learn more about their bodies and the outside world. The second phase is the rudimentary movement phase in which infants get voluntary movement required for survival. The third phase is the fundamental movement phase in which young children are actively involved in exploring the movement potential of their bodies. The last phase is the specialized movement phase in which children apply movement as a tool to a variety of complex physical activities for daily living, recreation, and sports pursuits. There are three categories of movement across the four phases of motor development: stability, locomotor, and manipulative movement skills.

Preschool years belong to the fundamental movement phase. In the entire fundamental movement phase, it accompanies with three overlapping stages: the initial stage, the emerging elementary stages, and the proficient stage. FMS goes through a definite, observable process from immaturity to maturity in these stages. Under the

proper circumstances, children can reach the mature stage by age 6 in most fundamental movement skills (Gallahue et al., 2012). PE in kindergarten makes a significant contribution to the development of fundamental movement skills in the fundamental movement phase. Quality PE curriculum will offer preschoolers opportunities for practice, encouragement, and quality instruction in learning to help them achieve the mature stage.

2.1.2 Dynamical systems theory

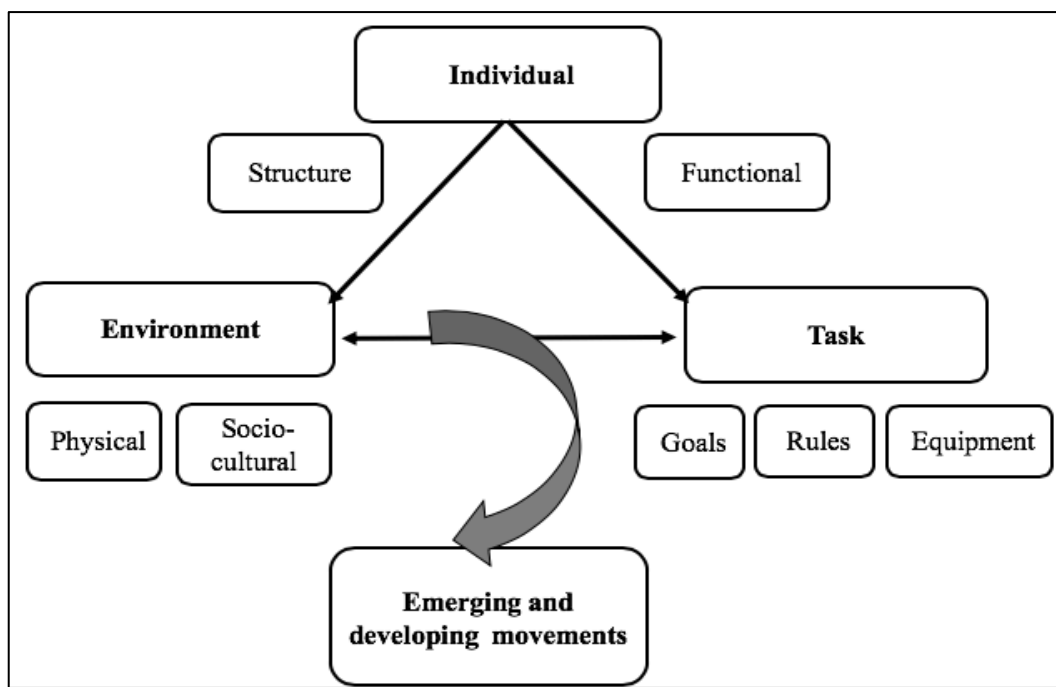
Several factors influence children's motor development except for maturation. Dynamical systems theory is a framework to explain changes that occur during motor skill performance and the underlying factors that influence the development of skills (Newell, 1984; Thelen & Ulrich, 1991). Different researchers put forward their ideas (Model and Metaphor) about the understanding of both the product and the process of motor development from the perspective of dynamical systems as heuristic devices.

Newell offered a Constraints Model (Figure 2.2) to show how the factors (individual, task, and environment) interacted with each other to influence the motor development (Newell, 1984, as cited in Payne et al., 2008, p.64). Dynamical systems theory considers the individual, the environment, and the task as three subsystems. In the Constraints Model, task constraints can include such as the goal of task, the rules, the size and amount of equipment; the environmental constraints are temperature, the surface of play area, indoor or outdoor facility; the individual constraints are the individual's skill level, motivation that influence performance (Newell, 1984). Any changes in the constraints would lead to changes in the movements, thereby influence the development of different motor skills (Newell, 1991).

Newell's constraints perspective provides a guide for teachers in planning PE curriculum comprehensively to enhance the motor development of children. Preschoolers motor development rely on not only the individual but also the environment in which the individual moves, and the task the individual is trying to accomplish. The speed, order, and quality of motor skills that children acquired were mostly dependent on educational tasks and the environment (Gao, 2007). Teachers need to enrich and expand preschoolers' movement experiences by changing the

environment and task conditions according to the levels of preschoolers' movement development. Because of dynamical systems theory, the research on motor development has turned from result-oriented research to process-oriented research. This theory helped teachers better understand the relationship between teaching and learning, teachers and children, curriculum design and implementation, and children's learning outcomes and development evaluation with a dynamic vision (Payne et al. , 2008, p. 55).

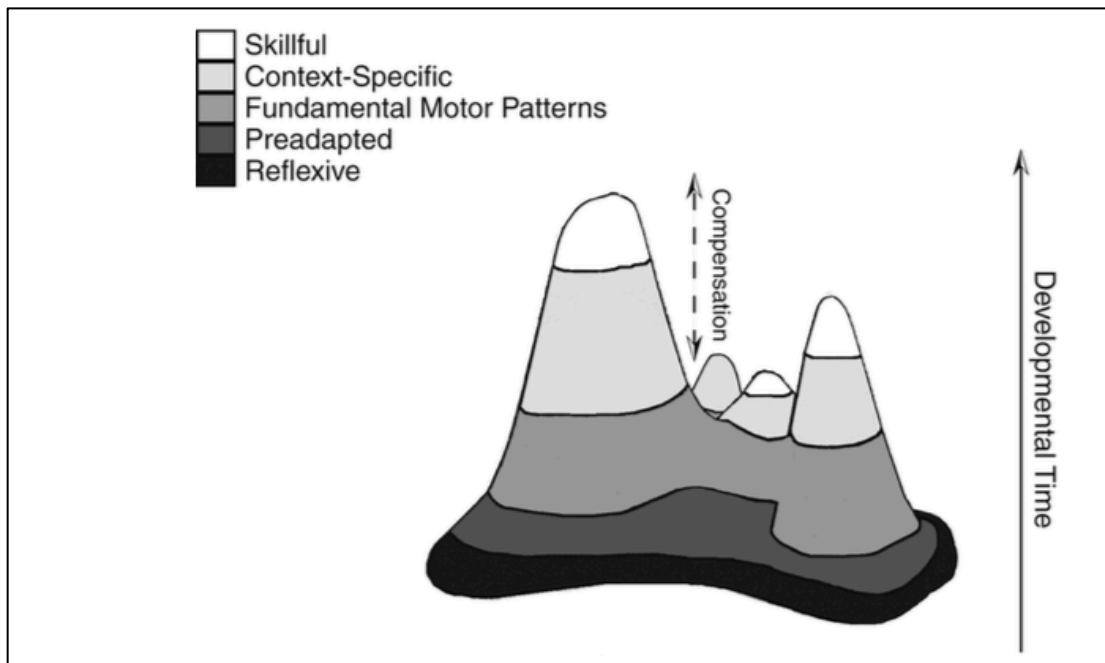
Figure 2.2 Newell's Constraints Model in Motor Development (Newell, 1984)



Clark and Metcalfe (2002) proposed the Mountain of Motor Development Metaphor (see Figure 2.3) to characterize both the products and the process of motor skill development. It emphasized the cumulative, sequential, and interactive nature of motor skill development as an emergent product of lifelong changes in multiple sources of constraint on behavior (Clark & Metcalfe, 2002, p. 167) . It includes six periods of human motor development to ascent up the mountain: the reflexive period, the preadapted period, the fundamental patterns period, the context-specific period, the skillful period, and the compensation period. The previous period contributed to

acquiring the necessary skills for the following period. The fundamental patterns period established the basis for future movement endeavors. Movement choices made later in life will depend on motor skills developed during this critical time (Payne & Isaacs, 2017). In preschool years, teachers and parents should create the environment for preschoolers to pursuit early movement experiences and get the building blocks for being physically active in later life.

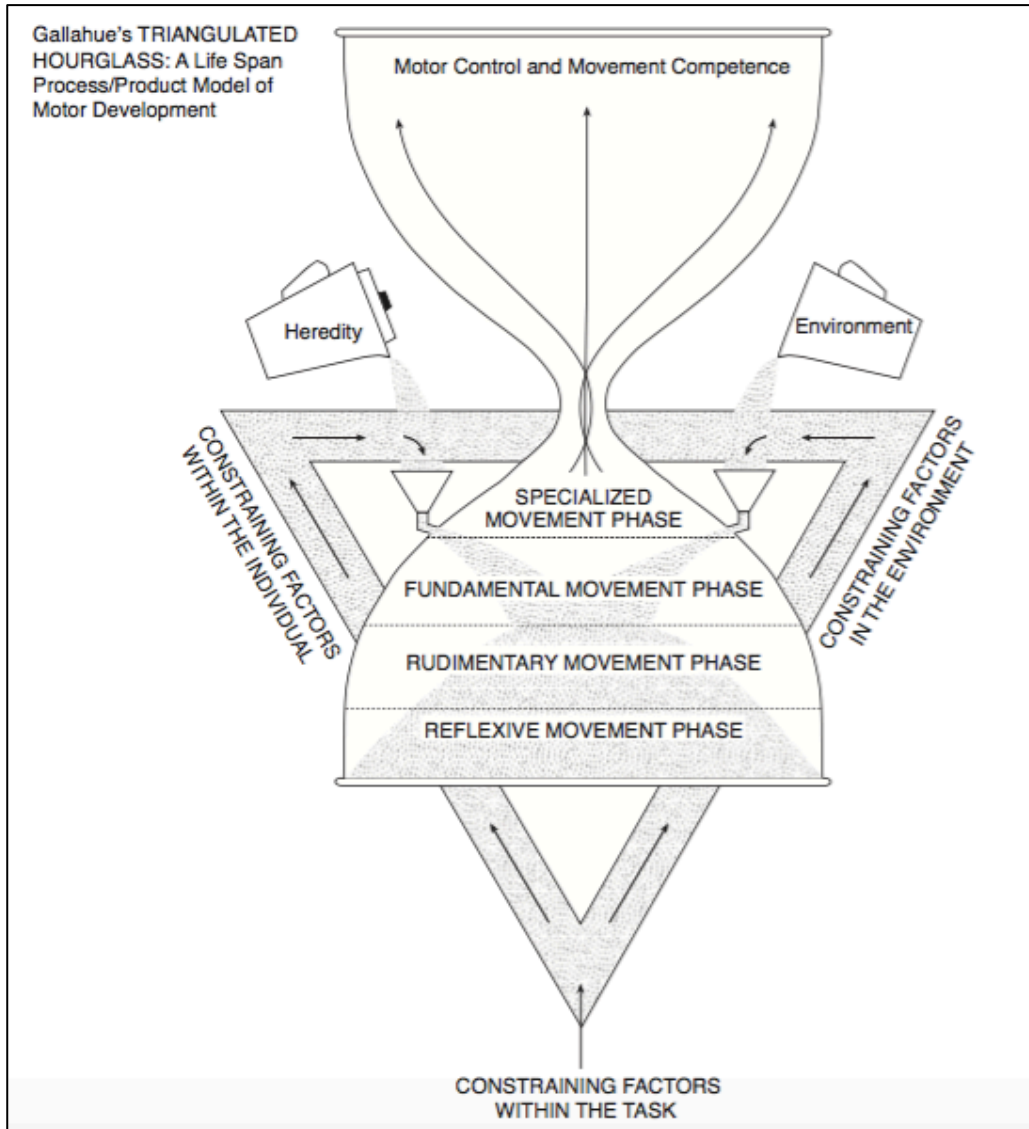
Figure 2.3 The Mountain of Motor Development (Clark & Metcalfe, 2002, p. 73)



Gallahue (2012) provided the Triangulated Hourglass Model (see Figure2.4) for explaining the process of motor development. It is a model of motor development that influenced and was influenced by a wide variety of cognitive and affective factors operating within both the individual and the environment (Gallahue et al., 2012). In this model, maturation played a role in the development of fundamental movement patterns, but children do not develop motor skills ‘automatically’ as they mature. Teachers’ instruction and feedback are valuable. Gallahue et al. (1997) noted that every teacher at the fundamental movement phase must learn to recognize and analyze the task requirements of movement skills to maximize children’s learning (p. 90). If children do

not get enough opportunities to achieve proficiency in FMS, they will meet barriers in the further development of the specialized movement phase.

Figure 2.4 Gallahue's Triangulated Hourglass Model (Gallahue et al., 1997, p. 89)



The movement theories offer teachers a vivid theoretical framework to understand the vital position of FMS in the whole life and what influences an individual's FMS development during their preschool years. From the phase stage theory and dynamical perspective of model and metaphor, motor skill development was seen as the result of a process in which changing constraints interacted, and a cumulative and sequential pattern of developing motor skills occurred (Clark & Metcalfe, 2002; Salehi et al., 2017). Preschool years are an essential period to prepare for an individual's physically

active life in the future. The ecology (context) of the environment, such as opportunities for practice, encouragement, instruction affected the degree to which FMS developed (Salehi et al., 2017). Family and kindergarten are the most important places for children to get enough chances to develop their FMS. Teachers should care about the individual's ability and interest, give preschoolers clear instructions to improve their motor development. Parents should encourage preschoolers to practice more and learn to arrange their movement life by themselves outside of kindergarten.

2.1.3 Physical literacy as the goal of physical education

2.1.3.1 The definition of physical literacy

After this concept was systematically analyzed, researchers and institutions have expanded its original meaning. Many different interpretations of physical literacy have been put forth for consideration. In American, physical literacy is described as : “the ability to move with competence and confidence in a wide variety of physical activities in multiple environments that benefit the healthy development of the whole person” (SHAPE). In Canada, “Physical Literacy is moving with competence and confidence in a wide variety of physical activities in multiple environments that benefit the healthy development of the whole person” (Physical and Health Education Canada, 2015) . In Wales, Physical literacy is defined as “a disposition acquired by human individuals encompassing the motivation, confidence, physical competence, knowledge and understanding that establishes purposeful physical pursuits as an integral part of their lifestyle” (Morgan et al., 2013) . In England, Physical Literacy can be described as “the motivation, confidence, physical competence, knowledge and understanding that provides children with the movement foundation for lifelong participation in physical activity” (Youth Sport Trust). Whitehead also revised her definition of PL as “the motivation, confidence, physical competence, knowledge and understanding to value and take responsibility for engagement in physical activities for life” (IPLA, 2017). Though there are different definitions, Whitehead emphasized the following parts: the affective, the physical, the cognitive, the fundamental goal of physical literacy being lifelong participation. (Spengler, 2015).

In China, the concept of physical literacy is not so popular, but there is a phrase “Ti Yu Su Yang” that is similar in literal meaning to PL, while their specific meaning is different. “Ti Yu Su Yang” refers to the cultural level of sports, including sports awareness, basic motors skills, movement competence, sports knowledge, and the ability to engage in physical exercise, sports entertainment, and sports appreciation (Lai, 1990). This definition was accepted by more persons than any others in China. “Ti Yu Su Yang” was regarded as a comprehensive concept in China from the previous studies. Its definition was unclear; its attributes were uncertain; the philosophy and value were too limited in physical education subject (Chen, 2017). While, the concept of physical literacy was based on the philosophical foundation of Monism, Phenomenology, and Existentialism, emphasizing people’s “embodiment” (Whitehead, 2010). It was systematically discussed from the perspective of human survival and development.

2.1.3.2 The philosophical foundations of physical literacy

Physical literacy has its roots in philosophy and originates from the study of Monism, Existentialism, and Phenomenology (Whitehead, 2001). These foundations were the center to the concept of physical literacy and informed how it was brought to life in practice.

Monism viewed a person as an invisible whole which had body and mind as two elements of an integrated entity (Whitehead, 2001). Different dimensions of the human condition were recognized and interwoven in existence and can be considered embodied (Whitehead, 2001). The commitment to Monism was reflected in the definition of physical literacy, which encompassed three critical characteristics of human nature - the affective, the physical and the cognitive (Whitehead, 2013b). Chen (2015) pointed out that “physical literacy was a concept that embraced an integrated view of the mind and body to explain, promote, and help sustain human beings’ fundamental function: movement” (p. 2).

Existentialists asserted that human created themselves through their interaction with the environment, so the nature of human beings was a result of the accumulated experiences they got in the different environment in which they live (Whitehead,

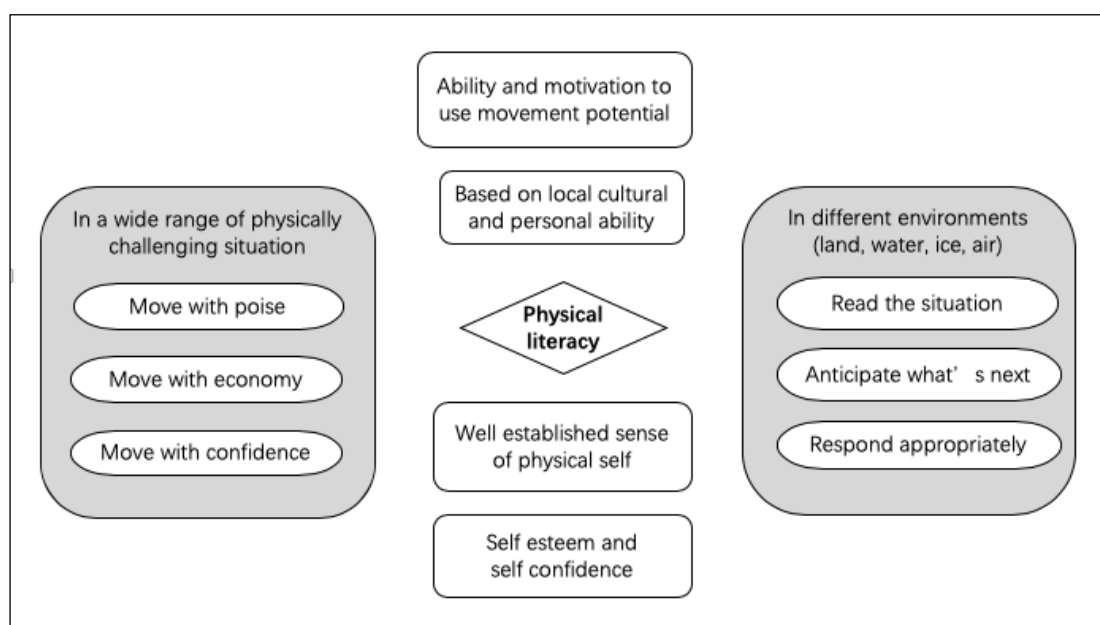
2013a). Humans are born with a wealth of potential capability. The more frequent one interacted with the environment, the more one would develop the human potential. Each person has its way to interact with the world and become a unique person. Individuals not only created their own world but also were constantly modified during their interaction with the world (Whitehead, 2001).

Phenomenologists put an important foundation for perceiving the world from the backdrop of previous interactions (Whitehead, 2013a). The interaction of body and mind with the surroundings ran through one’s whole life, the current time and space of the interaction of body and mind all penetrated the cultural heritage and human development. PE, as a unique cultural carrier which integrated the individual body and mind in various environments, reflected different values and beliefs. Moreover, each had a different quality of life in a different culture.

2.1.3.3 The components of physical literacy

Figure 2.5 figured by Higgs (2010) showed the components of physical literacy as drawn from Whitehead’s work (2001). It contains three parts:

Figure 2.5 The components of physical literacy (Higgs, 2010, p. 6)



(1) Movement capacities

The specific embodied capacities would include capacities such as balance, coordination, flexibility, agility, strength, power, endurance, and speed. These capacities allowed humans to carry out a wide range of FMS, such as walking, running, jumping, climbing, etc. Individuals developed the skills according to their local culture and base on their movement potential or ability. The physically literate person has the knowledge, skills, attitude, and motivation to fully use their capacities and potential for movement.

(2) A wide range of physical challenging situations.

These situations included two kinds: one was the natural world, such as water, different surfaces, hills, trees, and all sorts of situations in nature. The other was human-made situations, such as bicycles, ladders, tires created for individuals. In these situations, the physically literate person moved with poise and grace, with an economy of movement and with confidence.

(3) ‘Reading’ the environment

It meant individuals could understand and respond appropriately to the novel environment. By perceiving the environment, a physically literate person was able to read the situation immediately through different senses, via experience and the relevant components he confronted such as the shape, the size, the weight, the speed, the surface and so on. Then they would decide how to do and predict what was likely to happen, and they were able to react through movement appropriately.

A physically literate person was a well-established sense of their physical self, and a high level of self-confidence and self-esteem came from his/her successful interaction with a variety of situations by using their body and abilities.

2.1.3.4 The relationship between physical literacy and physical education

Whitehead said that PE was a subject area in the school curriculum, while physical literacy was the goal of PE (Whitehead, 2013b). Physical literacy was depicted concisely and clearly as a goal of PE. The principal aim of physical literacy was to equip all individuals with the “motivation, confidence, physical competence, knowledge, and understanding to maintain physical activity throughout the life course”

(Whitehead, 2001). Whitehead identified the following critical elements to make teachers know what should be taught to nurture children's physical literacy in PE (Murdoch & Whitehead, 2013, p. 56):

- a. A positive attitude toward physical activities through having experienced a sense of achievement and enjoyment in the subject;
- b. The motivation and confidence to continue participation in physical activity;
- c. Movement competence, commensurate with their physical potential;
- d. Experience of a range of movement activities;
- e. Realistic self-knowledge and self-awareness enabling them to set proper personal goals in respect to physical activity;
- f. An understanding of the nature of movement and the importance and value of physical activity as contributing to a physically active lifestyle;
- g. An understanding of how to access physical activities beyond the school.

All these specific elements made physical literacy more visible and assessable for teachers to develop children's physical literacy in PE. Teachers tried to integrate physical literacy into physical activities as the goal of PE for preschoolers in practice. Clements & Schneider (2017) offered a theoretical foundation and specific tested program plans on how to implement age-appropriate physical activities to foster children's PL. Words and actions worked together in the lesson plan that enriched children's knowledge of their expanding world, their understanding of themselves and others, their ability to move competently and confidently within it (Clements & Schneider, 2017). Heather (2017) helped educators teach high-quality, fun games, and activities that supported the unique needs of their learners as they developed PL for children and youth aged from 4-17. Physical literacy was described clearly, and teachers could understand easily where physical literacy was and how to develop confidence and competence in physical activity.

From a practical standpoint, the concept of physical literacy helped teachers articulate to children and the general public what PE was trying to accomplish (Roetert & MacDonald, 2015). As the goal of PE, from the perspective the teachers, physical literacy could be understood, remembered, expressed clearly, and applied in teaching

easily. From the perspective of the children, they would gradually understand the concept and could assess their physical literacy by themselves. It was a significant part of making progress in their journey of pursuing physical literacy.

2.1.3.5 The assessment of physical literacy in previous research

Physical literacy was not easy to be assessed. Whitehead noted that physical literacy was a multifaceted conceptualization of the skills required to fully realize potentials through embodied experience (Whitehead, 2010). Giblin et al. (2014) also asserted that physical literacy was a pertinent concept in pedagogical education terms and interlinked physical, psychological, and behavioral skill learning. From Whitehead's perspective, psychological correlation including perceived competence, enjoyment, and belief that engaging in physical pursuits was valuable; behavioral characteristics, such as goal setting, imagery, and reflection, appeared to play a crucial role in pursuing personal achievement in physical activities; physical movement skills included three movement capacities (fundamental, combined and complex) (Whitehead, 2010). Researchers used a variety of measurements to test the obfuscated physical components (Giblin et al., 2014). Various tools were adopted to assess preschoolers' physical literacy in different research.

Physical literacy was tested comprehensively. The Canadian Assessment of Physical Literacy was a comprehensive research-grade protocol to assess a broad spectrum of skills and abilities that contribute to physical literacy. These included physical activity skills, daily behaviors, motivation and confidence, knowledge and understanding, and physical competence (Healthy Active Living and Obesity Research Group, 2017). The Preschool Physical Literacy Assessment Tool (Pre-PLAy) was an assessment instrument to measure children's physical literacy during their early years (Cairney, 2018) . Wainwright (2014) used combination methods to test children's physical literacy development, specifically, TGMD-2 (Ulrich, 2000) was used to test children's motor skill competence, Harter Perceived Competence Scale (Harter, 1984) was used to test children's confidence, Social Play Continuum (Broadhead, 2006) and Leuven Involvement Scale (Leavers, 1994) were used to test children's motivation and engagement.

Several assessments of motor skills were also used as proxies for physical literacy, including: Test of Gross Motor Development-2 (Ulrich, 2000) and Test of Gross Motor Development-3(Fu et al., 2018; Maher et al., 2018; Ulrich, 2016), the Bruininks–Oseretsky Test of Motor Proficiency (Bruininks & Bruininks, 2005), the Movement Assessment Battery for Children-2 (Johnston & Watter, 2006), and the MOBAK-KG (Herrmann et al., 2018).

Though adequate assessments would provide a more robust evidence base to support the development of PL, it was always important that the teaching process should focus on developing PL. Almond & Whitehead (2012) emphasized that no matter what kind of tools were used to assess preschoolers' PL, teachers should first concentrate on the process of applying high-quality pedagogy to reflect their definition and philosophy of physical literacy, before assessing the outcomes (p. 68).

2.1.4 The Achievement-Based Curriculum model provided a logical process to construct a systematic PE curriculum

The Achievement-Based Curriculum (ABC) model was built on the history of curriculum theory in PE. It provided a logical process that could guide teachers through the integrated five steps (see Figure2.6) of program planning, assessing, implementation planning, teaching, and evaluation to construct a systematic PE curriculum (Kelly et al., 2004).

(1) The program planning step is the process of deciding what teachers should teach, breaking the goals into learning objectives, calculating how much content can be included in the sequence. The goal must be defined operationally to show how the skill is performed (process) and the result of the performance (Kelly et al., 2004, p. 67-72).

(2) The assessing step is a process for collecting information on student performance and communicating to children where they are on the content being taught and what they need to learn next. (Kelly et al., 2004, p. 76-81)

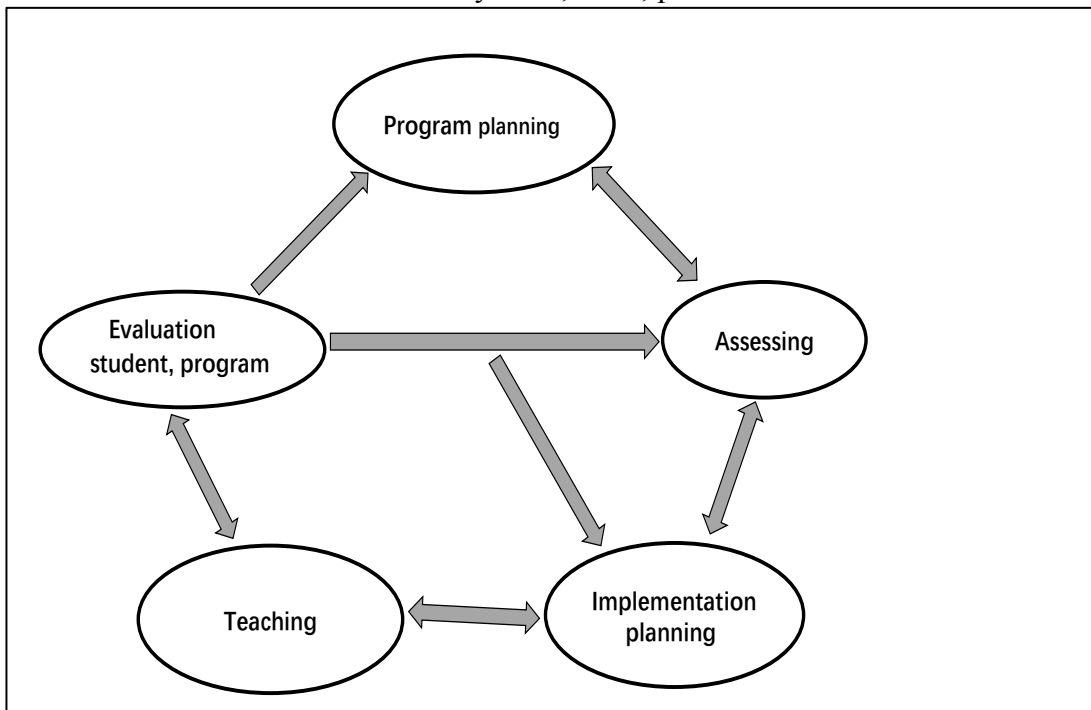
(3) The implementation planning step is the process of developing teaching templates which define what the teacher does during instruction and developing student learning formats which define how the students engage with the content to be learned. (Kelly et al., 2004, p.81) .

(4) The teaching step is the process of instructing students on how they can correct their performance during the practice drills and activities, and how the students will know if they are doing the skill correctly during practice (Kelly et al., 2004, p. 83-85).

(5) The evaluation step is the process of interpreting the degree to which individual children have achieved the content they were taught, and how they are progressing toward achieving the goals of the program (Kelly et al., 2004, p. 85).

Figure 2.6 The five interdependent components in the ABC Model

(Kelly et al., 2004, p. 67)



The ABC model provided a dynamic process which might give teachers' systematic instruction to develop an effective PE curriculum on their own unique curriculum goal. Tyler's "Objective Model" offered the process of a curriculum development model, and the ABC model offered operable strategies on how to determine the goal, select content, organize content, and evaluate curriculum. It was appropriate to be employed to instruct kindergarten teachers to develop a systematic PE curriculum based on their kindergarten step by step.

2.2 The current situation of kindergarten PE curriculum in China

After the People's Republic of China was founded in 1949, kindergarten PE became the essential parts of preschool education. Kindergarten PE has experienced a process of uneven development in the historical periods. With the hard work of specialists, researchers, and teachers, the kindergarten PE curriculum has formed its unique characteristic in China.

2.2.1 The connotation of kindergarten PE curriculum

From the definitions of kindergarten curriculum mentioned before, different researchers had a different emphasis on the curriculum definition. Tang (1997) stated that the kindergarten curriculum should be understood from three levels. Firstly, preschoolers must gain experience through activities. Kindergarten curriculum should focus on direct experiences, emphasizing the activity nature of the curriculum. Secondly, the experiences learned by preschoolers should be selected, valuable experiences, rather than scattered, messy natural experiences, emphasizing the experience nature of the curriculum. Thirdly, teaching programs must be implemented to produce educational. From this perspective, the kindergarten curriculum was a systematic program consisting of educational goals, educational content, educational organization, and educational evaluation (wang , 2004), emphasizing the systematization nature of the curriculum.

The relevant researchers defined kindergarten PE curriculum from two perspectives. One was from activity nature of the curriculum. For example, Wen (2011) stated that the kindergarten PE curriculum revered to activities which kindergarten teachers specially organized for preschoolers to concentrate on learning PE knowledge, practicing specialized sports skills or sports quality. Li (2013) noted that the kindergarten PE curriculum was guided by the national standards for kindergartens, a purposeful, organized, and planned PE program was provided to complete the physical activity needs of the preschool stage, it included gymnastics, PE teaching, outdoor free activities, and other types of physical activities. Li (2012) stated that the kindergarten PE curriculum was about preschoolers' PE. It followed the laws of preschoolers'

physical and mental development. It aimed to enhance physical fitness, to promote normal physical development and coordinated development, to cultivate good habits, to establish correct health concepts, and to establish stable sports behavior. It took games, basic movement exercises, sports equipment activities as the content, combining with appropriate teaching methods and dynamic educational practice activities such as safety and health measures. Liu (2015) argued that the kindergarten PE curriculum was the sum of preschoolers' specific physical activities which included morning exercises, physical fitness classes, outdoor physical activities, indoor physical activities, preschoolers' sports meeting, and hiking. The other perspectives were from systematization nature of the curriculum. Tong et al. (2007) stated that the kindergarten PE curriculum was guided by *Kindergarten Work Regulations*, *Kindergarten Work Procedures*, and *Teaching Guideline for Preschool Education*, followed the physical and mental development laws of preschoolers, the development needs of the community, and the advantages and characteristics of various regions. It had a system for the goals, content, methods, and evaluation of preschoolers' PE. Jiang (2015) stated that the kindergarten PE curriculum was based on the laws and needs of the physical and mental development of preschoolers, transferred the PE ideas into PE means through scientific theoretical knowledge, and had a systematic scientific goal, content, methods of organization and evaluation.

The connotation of kindergarten PE curriculum highlighted the activity nature of the curriculum, less systematization of it. The definitions of kindergarten PE curriculum reflected the activity or systematization nature of the curriculum. However, from a general point of view, more researchers tended to define it from the perspective of activity. They claimed that kindergarten PE curriculum was all kinds of physical activities. Therefore, in practice, they explored more about how to organize different forms of physical activities and ignored the intrinsic connection between activities. Fewer researchers tended to define it from the perspective of systematization. Therefore, the study of PE curriculum concerned less about the goal, content, implementation, and evaluation as a system, resulting in imperfect development of the kindergarten PE curriculum system.

2.2.2 The goal of kindergarten PE curriculum

The goal of PE is the starting point and the foothold of kindergarten PE. It declares the direction of education and the expected educational results. The goal of kindergarten PE not only reflected the needs of children's physical and mental development but also reflected the requirements of the nationality and the Times to children. Different policies were issued to promote the development of kindergarten PE. The goals of kindergarten PE changed in five historical development stages (Chen et al., 2011).

The first stage (1949-1957), kindergarten PE developed evenly. *Kindergarten Temporary Procedure (Draft)* (Ministry of Education, 1952) stipulated that kindergarten should cultivate children's necessary hygiene habit, pay attention to their nutrition, exercise their body, ensure their healthy development". PE was put in a very critical position in kindergarten. Teachers learned a lot from the former Soviet Union in theories and practice. Kindergarten PE textbooks and many materials were published to help teachers improve their teaching abilities in PE.

The second stage (1958-1965), kindergarten PE developed difficultly. The previous policies and experiences were denied totally, and the quality of PE declined. The third stage(1966-1976), kindergarten PE was destroyed. The content of PE was abandoned completely in kindergarten. The quality of PE declined rapidly.

The fourth stage(1977-1999), kindergarten PE was recovered. *Kindergarten Education Regulation* (Ministry of Education, 1981) stipulated that kindergarten should exercise children's body, ensure their healthy development, improve their physical fitness, develop their fundamental movement skills. *Kindergarten work procedures* (Ministry of Education, 1996) stipulated that kindergarten should promote the healthy development of children's body and the coordinated development of body function, enhance children's physical fitness, promote their mental health, cultivate their good living habits, health habits and interest of participating in physical activities. Many policies were issued to aid the scientific development of PE from content, time, space, and equipment.

The fifth stage (2000--), kindergarten PE developed rapidly. *Teaching Guideline for Preschool Education* (Ministry of Education, 2001) stated the general goal of kindergarten PE: “children should have a preliminary sense of safety and health, should know how to care themselves, and love to participate in physical activities.” *Guidelines of learning and development for children ages 3-6* (Ministry of Education, 2012) described the physical and mental condition, movement development, living habits, and living skills of preschoolers in the health domain. It described the goal of the kindergarten PE more specifically and listed the possible goals of the movement development of preschoolers in different ages. *Guidelines of sports for Children Ages 3-6* (General Administration of Sport, 2018) claimed that the goal for children’s sports was to improve children’s ability to adapt to the environment, to ensure their cognitive, affective, social psychology development, to develop their FMS and help them cultivate their habit of participating in physical activity in whole life. More specialists and teachers began to research to improve the quality of PE. Kindergarten PE developed rapidly and scientifically.

Different researchers described the goal of kindergarten PE in a variety of ways in their research according to the policy documents. Tan (2001) argued that the primary goal of kindergarten PE in China was to promote the physical development of children and enhance their physical fitness, to foster children’s interest in physical activities, to develop children’s good habits of in taking parting in physical activities, to develop children’s physical and mental health by taking part in physical activities. Xu (2003) stated that the purpose of kindergarten PE was to enhance children’s physical fitness; to promote their physical and mental development comprehensively, harmoniously, and healthily, to enrich their lives. Huang (2003) stated that the overall goal of kindergarten PE was to promote the physical development of children, to enhance physical fitness, to cultivate physical culture and make physical and mental develop harmoniously.

The goal of kindergarten PE curriculum was outlined in the policy documents. Whether it was the national document level or the practice research level, there was less operable in the goal system. From the above statements about PE goal, the goal of the PE curriculum mainly included physical and mental development, highlighting

“physical fitness”, “interest”, “habit”, and “physical and mental health”, “FMS”. All the policy documents became the primary reference for kindergarten teachers to determine the objectives of physical activities. The goal of PE was relatively vague and could not be understood clearly by kindergarten teachers. Teachers could not choose the corresponding content to organize physical activities and complete curriculum evaluation according to the description of PE goal. The goal of the PE curriculum needed to be specified so that it could act as the central axis to drive curriculum development. Wang (2018) and her research team tried to define the goal of movement game curriculum from healthy behavior, physical competence, and sports moral character. They tried to describe the goal of PE in a specific way. However, it was a way borrowed from elementary school to define the goal of PE, and some of the objectives were unachievable in kindergarten PE.

2.2.3 The content of the kindergarten PE curriculum

After years of practice, kindergarten PE has formed a relatively traditional content system in China. The content of kindergarten physical activities was that children do basic movement exercise to develop their gross motor skills and got joyful experience in kindergarten (Li, 2012). Xu (2003) had comprehensively discussed the content of PE from the types of physical activities in her book, including basic movement, basic gymnastics, physical fitness class, movement center activities, physical games, creative physical activities.

Basic movement referred to all the basic patterns of physical activities in daily life, including, walking, running, jumping, throwing, balancing, drilling, climbing, and sometimes twisting and rolling. Basic gymnastics was the general name of body movement organized and structured systematically. Generally, basic gymnastics included imitating gymnastics, free-standing gymnastics, light apparatus gymnastics, and basic queue practice. Physical fitness class referred to physical activities organized by PE teachers which aimed at the development of one or several movement capacities, including activities of power, endurance, agility, balance, speed, coordination, flexibility. The physical game referred to physical activities organized by class teachers, which combined movement, games, and instruction. Movement center activity referred

to physical activities that preschoolers played with large-sized, medium-sized, small-sized equipment freely. Creative physical activity referred to self-expression activity, which was rarely mentioned by most of the other researchers. Other researchers' viewpoints about the content of kindergarten PE were much the same as Xu's definition (Huang, 2003; Liu, 1998; Tan, 2001; Sun, 1998; Zhou, 2008).

Besides, some researchers discussed the content of PE from basic movement to explore the new composition of kindergarten physical activities according to the division of the basic activity of the human body. Li (2012) offered an "open-minded" content of framework which was formed by 11 types of practice. They were the "moving category", the "jumping category", the "drilling category", the "climbing category", the "throwing and catching category", the "carrying category", the "rolling category", the "weighting category", the balancing category", the "supporting category", and the "hanging category". According to the theory of human movement development, Nie (2014) divided the content of kindergarten PE in his experimental study into four kinds which were locomotor skills, object control skills, balance ability and flexibility ability.

The latest research trended to introduce the general international concept of FMS, which contained locomotor skills, object control skills, body management, and balance skills into kindergarten in China (Liu et al., 2016). Locomotor skills involved the body moving in any direction from one place to another, such as walking, running, jumping, hopping, dodging, and skipping. Object control skills involved handling and controlling objects with the hand, the foot or an implement (stick, bat or racquet), such as throwing and catching, kicking, dribbling, and striking. Body management and balance skills involved the body balancing either in one place or while in motion, such as landing, balancing (static and dynamic), and rotation.

The concept of FMS was much specific than the concept of basic movement used before for teachers to understand the content of physical education. FMS were the building blocks of movement, specific sport, physical games, and other sports skills for later in childhood (Clark, 1994; Gabbard, 2000; Haywood & Getchell, 2002; Payne & Isaacs, 2005). In China, researchers have claimed FMS to be the core content

knowledge in the health domain of kindergarten teaching (Liu et al., 2016). The framework of FMS has broadened the viewpoints of kindergarten teachers in choosing the content of PE.

The content of the kindergarten PE curriculum emphasized FMS, however, cognitive and affective aspects needed to be strengthened. The kindergarten PE curriculum in China had formed a particular content system from the movement perspective for kindergarten teachers to select. Though movement development was the essential part of the kindergarten PE curriculum, the cognitive and affective aspects should not be ignored. Children's knowledge about body movement, physical competence, and healthy lifestyles contributed to the development of their FMS development. At the same time, positive affection such as self-confidence, self-esteem, and joy that preschoolers developed in physical activity would help them continue to participate in physical activities in the future. The content of the PE curriculum should combine the movement part, cognitive part, and affective part to promote the development of a whole child in different types of physical activities.

2.2.4 The implementation of kindergarten PE curriculum

2.2.4.1 Different ways to organize physical activities

Teachers used structured and unstructured ways to organize physical activities in kindergarten in China. Typically, structured ways included morning gymnastics, physical fitness class, physical games, and unstructured ways included movement center activities. Different kinds of physical activities reflected different values and formed their characteristics. It was no doubt that unstructured free play was important to cognitive, social, affective and motor development of preschoolers, but structured physical activities have been shown to produce higher levels of physical activity in young children (Parish, 2007).

Morning gymnastics aimed at exercising children's muscles, joints and ligaments; promoting the development of children's physical quality of strength, flexibility, balance, and coordination; fostering children's correct physical posture and a certain sense of rhythm, and developing children's spatial awareness and time awareness (Liu,

1998). Morning gymnastics had a long history in China. Most preschoolers did morning gymnastics every morning in kindergarten in China. Morning gymnastics in Chinese kindergarten had its features. It consisted of seven parts: warm up, queue practice, free-standing gymnastics, transition part, apparatus gymnastics, games, and relax. It often lasted 12 to 18 minutes. Every semester, kindergarten teachers created a new one with children and did it during the whole semester every morning.

Physical fitness class was a kind of purposeful, planned, organized physical activities. It took FMS of the body as the main content, it focused on the comprehensive development of children, aiming at improving the physical ability of children and enhancing the physical fitness of them. It contained three parts: warm-up, body part, and relaxing part. It often lasted for 20-35 minutes. Usually, preschoolers had physical fitness class one or two times a week. The quality of physical fitness class had a direct effect on children's movement development. This kind of classes was organized by PE teachers who had specialized PE knowledge and skills to teach children. However, only a small amount of kindergartens had PE teachers. It was a big challenge for class teachers to organize quality physical fitness class.

The physical game took FMS as the main content. It was the most basic form of kindergarten physical activity which integrated the movement, game, and educational instruction by class teachers. It lasted for 20-30 minutes. It aimed at strengthening children's physical fitness. Class teachers paid much attention to the games, ignoring children's movement development in teaching. Class teachers organized physical games for children two or more times a week, but this kind of activities was often substituted by movement center activities which class teachers did not need to plan for it carefully or other quiet activities.

Movement center was a place where children freely chose movement equipment and partners to develop their physical capacities, such as climbing center, traditional game center, driving center, balancing center. Teachers cared much about children's safety than instruction in these centers. Each event lasted for 20-40 minutes.

There were different ways to organize physical activities, the effective combination of forms needed to be considered. The implementation of kindergarten PE

curriculum in China had formed relatively stable ways. In the implementation process, kindergarten teachers considered more about how to combine different ways of physical activity to meet the time required (at least one hour of physical activity every day) from the external conditions such as teachers, places, equipment, weather and time. They considered less about the value and proportion of various ways of activities in achieving the goals of PE, the internal relationship between various ways was not clear, and it was necessary to consider all ways of internal organizational forms and external combination forms from the whole. All the activities should be organized effectively and work together to promote the whole development of preschoolers.

2.2.4.2 Time of physical activity in kindergartens

Preschoolers had less time to take physical activities in kindergarten in China. According to *Kindergarten Work Procedures (new)* (Ministry of Education, 2016), *Guidelines of Sports for Children Ages 3-6* (2018), kindergarten should offer no less than one hour for children to take physical activity in China. Kindergarten teachers tried to organize structured and unstructured physical activities to guarantee at least one hour for children every day, but the weather and other reasons often influenced the amount of actual time. The amount of physical activity time offered for children in China was relatively less than in other countries.

In the Czech Republic, kindergarten offered more than one hour of indoor and outdoor physical activity for children almost every day. As research showed that kindergartens provided a daily 2x20 minutes carpet exercise and 50-70-minute walk outdoors and then setting sufficient time for other spontaneous physical activity at the schoolyard (Sigmund et al., 2008). In Denmark, no matter what was the weather like, two hours of unstructured outdoor physical activities were on a daily schedule to get children to adapt to the environment and move their bodies freely. In the United States, NASPE recommended that preschoolers engaged in a total of 60 minutes of structured physical activity daily, spread throughout the day, as well as 60 minutes of unstructured physical activity (NASPE, 2000). In Australia (Australian Government, Department of Health & Ageing, 2010), in the United Kingdom (Department of Health, 2011), and

Canada (Tremblay et al., 2012), the minimum amount of time was increased to 180 minutes of physical activity per day.

Kindergartens tried to offer time and many opportunities to increase preschoolers' physical activity, but the quality of physical activity was low. Researchers used observation, pedometer, and accelerator to test preschoolers' physical activity level, they found that physical activity levels appeared to be quite low in different settings though parents thought children were active in kindergarten every day (Bower et al., 2008; Pate et al., 2008). Children's physical activity levels varied considerably, which depended upon the child-care facility they attended. Children in child-care centers engaged in moderate-to-vigorous physical activity during 3% of the observation periods and were sedentary 80% of those periods (Pate et al., 2008). Other researchers also noticed that children rarely achieved 60 minutes of moderate-to-vigorous physical activity during the child-care day (Cardon et al., 2008; Reilly et al., 2006).

The time of physical activity was limited; the quality of physical activity needed to be improved. Because of the limited time for children in China, the quality of structured physical activities was more important to be concerned. FMS was not naturally emerged as a mature pattern but required instruction and practice to learn (Gabbard, 2000; Haywood & Getchell 2001; Newell, 1984). PE curriculum should be designed expertly to combine structured and unstructured physical activities to offer children more chances to be physically active.

2.2.4.3 The space and equipment of PE in kindergartens

Space and equipment were the main carriers of physical activities for preschoolers. The space of kindergarten PE, numbers, and sorts of equipment had a significant effect on the quality of kindergarten PE. For space, Teachers should focus on the enough open space, the materials of the playground, the types of the playground. There were four types of the playground, including the common playground, straight track, roof platform, windy and rainy playground. There was nearly no gym in most kindergarten in China. If weather permitted, most of the physical activities were organized on the playground; if the weather was terrible, children would have to take physical activities in the classroom or lose the chance. The playground was artificial in kindergartens,

especially in the city in China, while natural play yards were often offered in kindergartens of western countries.

Kindergarten offered sports equipment according to *The Standard of National Kindergarten Teaching Aids* (The Ministry of Education, 1992). Feng (2015) did a survey in kindergartens in a city. She found that kindergartens had many types of sports facilities. There were large-sized, medium-sized, small-sized sports facilities and some homemade toys for physical activity. There were fixed sports facilities and mobile sports facilities. Fixed facilities were large-scale slide combination, climbing wall, climbing frame, swing, swing bridge, crawl net, balance board, basketball shelf, small rocking horse, plum pile, small slide and so on. Mobile facilities were balls, hula hoops, tires, drill slits, trolleys, mats, stairs, sandbags, dumbbells, ropes, racquet, bicycles and homemade equipment such as Frisbee, kangaroo jumping bags, ball-flower.

The places and equipment of PE in kindergartens were relatively deficient, and teachers must use them appropriately. Kindergarten in China was much bigger than in other countries from the perspective of preschoolers' numbers. Kindergarten teachers should try to offer enough places and a variety of sports equipment for the development of children's physical fitness. If the types and numbers of sports equipment were used unbalanced, children's physical development was unbalanced. In designing the PE curriculum, the places and sports equipment were two significant "constraints" needed to be considered. Teachers should try to use the places and equipment efficiently and creatively to meet the movement needs of preschoolers.

2.2.5 The evaluation of kindergarten PE curriculum

Kindergarten curriculum evaluation was to explore whether the curriculum and implementation of the program in line with the purpose of education and children's characteristics, to tell whether children got the desired results by learning through the curriculum, to showed where the curriculum needed to be improved (Yu, 2014). At present, the evaluation of kindergarten PE curriculum was relatively weak. There were mainly formative evaluation and summative evaluation.

In formative evaluation, teachers evaluated their teaching situation and children's performance in the teaching process randomly. On the one hand, teachers evaluated

themselves to see if the teaching process was smooth; if the activity was designed consistently with the development of children; if the teaching objectives were achieved. On the other hand, teachers evaluated children by randomly observing children's motor skills and physical fitness development, children's emotional state, and their participation level in physical activity.

In summative evaluation, teachers tried to measure children's performance of FMS through testing. There were quantitative assessment approaches which told what children could do and qualitative assessment approaches which told how children did it. Quantitative assessment approaches involved measuring the product or outcome of the performance, and the result was usually compared to the performance of a normative group (Hands, 2002). For example, in China, the National Sports General Administration of China issued *The National Standard Manual for Physical Fitness Measurement (for kindergarten)* (General Administration of Sport, 2003) to test and evaluate children's physical fitness. The quantitative test outcomes did not provide direct information for teachers about the proficiency of children's performance.

A qualitative assessment was defined as "the systematic observation and introspective judgment of the quality of human movement to provide the most appropriate intervention to improve performance" (Knudson & Morrison, 1997, p. 4). Observation records or checklists for each FMS were usually generated to facilitate this approach. The Test of Gross Motor Development-2 evaluated children's gross motor skills from 3 to 10 years old based on specific qualitative performance criteria representing the mature pattern of locomotor skill and object control skill in TGMD-2 (Goodway, Crowe & Ward, 2003; Ulrich, 2000,). Researchers used TGMD-2 to test the development of children's gross motor in China. Diao (2013) established the object control subtest of children's norm from 3 to 10 years old in Jinan. Later the new edition "Test of Gross Motor Development-3 (TGMD-3)" was published and used to test children's motor skills (Ulrich, 2013). Shi (2013) established the locomotor subtest norm for children of 3 to 10 years old in Jinan. The Peabody Developmental Motor Scale-second edition (PDMS-II) provided a comprehensive evaluation of gross and fine motor skills from the reflex phase to the fundamental phase, but it focused on the task

result, not the motor skill process (Folio & Fewell, 2000). According to PDMS-II, the Preschooler Gross Motor Quality Scale (PGMQ) was constructed to evaluate preschoolers' locomotor skills, object control skills, and body management skills (Sun et al., 2010). In Australia, a range of assessment strategies were offered for teachers to support teachers in making fair, valid, comprehensive, explicit, and educative assessments of children's levels of achievement of FMS (Department of Education, WA, 2013). A qualitative assessment could offer information for teachers which specific components of skill an individual need to practice. Kindergarten teachers chose different kinds of tools to evaluate the development of children. According to Gallahue's viewpoint (1996), developmental PE programs focused on the 'process' or qualitative performance prior to the 'product' or quantitative performance of FMS.

The evaluation of PE curriculum was weak in kindergartens, effective evaluation ways needed to be explored. Kindergarten teachers often used the summative evaluation to carry out PE curriculum evaluation, some kindergarten teachers also did a formative evaluation in the teaching process, but they lacked the experiences to do it better. Some kindergarten teachers could not evaluate the PE curriculum. Curriculum evaluation lost the value of promoting curriculum development and children development. With the deepening of the research on the development of PE curriculum and children's movements, it was necessary to strengthen the research on formative evaluation and used a combination of qualitative and quantitative methods to evaluate kindergarten PE curriculum comprehensively.

2.2.6 The design of kindergarten-based PE curriculum

2.2.6.1 Kindergarten teachers could not design a systematic PE curriculum

Kindergarten teachers play an essential role in designing the PE curriculum. It was the reality that most teachers had to organize physical activities in kindergartens in China. However, most of them lacked chances to get professional training for PE during pre-service or post-service education. Thus, most of the teachers were struggling to learn how to organize physical activities by themselves and experiencing low self-efficiency in doing it. Teachers could not grasp the goal of PE clearly and comprehensively; they designed and implement curriculum randomly, lacking

professionalism and systematicness (Li, 2013; Tang, 2004). Most physical activities were taking as games which could not reflect all value of PE (Liang et al., 2015)

The conditions were much the same in other countries. Physical activity-related training and resources provided to early childhood educators appeared to be limited in Canada (Bower et al., 2008; Oliver et al., 2007). Early childhood educators' lacked experience or formal training to help them design developmentally appropriate movement education (Gagen & Getchell, 2006; Martyrium &Tucker, 2014). It had been reported that 72.1 % of early childhood educators in Canada had no physical activity/education courses in their formal training programs and 98 % of them could not accurately report the number of minutes preschoolers should spend being physically active in line with Canadian Physical Activity Guidelines for the Early Years (Martyrium &Tucker, 2014).

In facing the current situation in the kindergarten, it was urgent to take actions to make things better. The top thing was to make the goal of PE more visible and comprehensive to be grasped well by kindergarten teachers, to instruct teachers to learn knowledge of movement skills and teaching skills, and construct systematic PE curriculum.

2.2.6.2 The kindergarten-based PE curriculum was developed unevenly

The kindergarten curriculum was a whole system which was guided by clear curriculum philosophy and was composed of curriculum goals, curriculum content, curriculum implementation and curriculum evaluation (Yu, 2014). High quality of kindergarten curriculum could guide teachers effectively in teaching practice. At present, the kindergarten PE curriculum was developed unevenly in China; there were three types from the integrity perspective.

Firstly, there was no clear PE curriculum in kindergarten. The goal of the kindergarten-based PE curriculum was not clear. Kindergarten teachers chose content and organize physical activities based on their own experiences, the curriculum was evaluated randomly. Most of the kindergartens were confronted with this situation. Secondly, there was an incomplete PE curriculum in kindergarten. The kindergarten-based PE curriculum highlighted part of the PE curriculum. For example, Zou (2015)

explored the generation of the content of the kindergarten happy sports curriculum and its operation in practice. Zhang (2007) built a kindergarten-based PE curriculum based on life education, survival education, and loving education. Kindergarten teachers played as the role of the curriculum performer and did not participate in the curriculum design. Thirdly, there was a complete PE curriculum in kindergarten. For example, a kindergarten-based PE curriculum was built on the perspective of life sports. The goal system, content system, implementation methods, and evaluation system of the PE curriculum were constructed. Kindergarten teachers used related theories to design PE curriculum under the researchers' instruction, and kindergarten teachers became designers and implementers of the curriculum (Li, 2007).

Kindergartens teachers had made great efforts to build their own kindergarten-based PE curriculum. However, the kindergarten-based PE curriculum was developed unevenly; most kindergartens did not have a complete PE curriculum. Kindergarten teachers continued to explore a complete PE curriculum in practice to make it sustainable. They needed to cooperate with sports experts and preschool experts, and got theoretical support and practical guidance from them, to build the systematic kindergarten-based PE curriculum.

2.3 The development of kindergarten PE curriculum in other countries

The early stage of life was a critical period to enhance physical activity, as experiences, attitudes and habits affecting regular physical activity were formed in early childhood and tend to be throughout for life (Cleland, Dwyer & Venn 2012; Telama et al., 2014). The promotion of lifelong physical activity and a healthy lifestyle were the main aims of physical education in many countries. They paid much attention to PE in preschools by providing effective policies and guidelines to support kindergarten teachers' teaching. Kindergarten PE curriculum had distinct features in different countries, such as in the United States, England, Australia, and Canada.

2.3.1 The kindergarten PE curriculum in the United States

In the United States, the importance and values of movement across the lifespan were being recognized as never before. Policies lied in an essential position in helping preschool teachers design appropriate PE program. In 1992, The Council on Physical Education for Children (COPEC,1992) wrote a child movement learning document: *Developmentally Appropriate Physical Education Practices for Children*), which included the goals of health and physical fitness of children's PE and put forward the importance of school-based PE curriculum. In 1994, the COPEC(1994) published the book: *Developmentally Appropriate Practice in Movement Programs for Young Children Ages 3-5*, which was used for the adult to instruct children's movement learning. In 1995, the National Association for Sport and Physical Education(NASPE,1995) made a statement: *Moving into the Future: National Standards for Physical Education*, which set out the guiding direction, content benchmarks and assessment recommendations for kindergarten PE curriculum. It listed seven standards which a physically educated person should get in the kindergarten stage.

In 2000, the National Association for Sport and Physical Education (NASPE, 2000) enacted a document: *Appropriate Practices Movement Programs for Ages3-5*, which contained five independent parts about the movement learning environment, instructional strategies, curriculum, assessment, and professionalism. It provided specific guidelines to help persons who were responsible for PE programs for children ages 3-5 recognize and design movement programs that were best for children(appropriate), and recognize and avoid those that were counterproductive or harmful (inappropriate). NASPE hoped to use the curriculum objectives and guidelines to improve the quantity and quality of the physical activities, to improve children's movement ability, ability to adapt, and other aspects of learning ability (Li, 2007). In 2014, SHAPE America adopted physical literacy as the goal of PE and revised its national standards to align with the key elements of the new goal. The five national standards and the grade-level outcomes were intended to operationalize the concept of physical literacy and to provide a framework for teachers to use in developing curricula and lesson plans (Roetert & MacDonald, 2015)

In the United States, the developmentally appropriate PE curriculum was one of the areas of the overall preschool curriculum, but it also incorporated movement teaching into other fields, like music, language, and math. Clement & Schneider (2017) gave an excellent example to show how this kind of curriculum looked like in their book. The vital characteristic of kindergarten PE curriculum in the United States was to focus on children's individual development and feeling of success. Therefore, teachers would design an appropriate PE program for all children, including persons who had special needs. They offered movement environment, encourage children to enjoy the fun of the physical activity. They believed children were interested in physical activity because of genuinely loving it.

2.3.2 The kindergarten PE curriculum in England

In England, kindergarten did not have a unified national curriculum standard for a long time. Since 2000, things had changed. In 2000, the Department of Education and Skill (2000) published *Curriculum Guidelines for the Foundation Stage : 3 to 5*, and later *The Education (National Curriculum) (Foundation Stage Early Learning Goals) (England)* was enacted in 2003. The kindergarten PE curriculum was included in its national curriculum system. It stated that the content of the curriculum should contain six domains, and physical development was one of the independent domains. In physical development domain, the *Statutory Framework for the Early Years Foundation Stage* (DCSF,2008, 2017) showed the goals which included moving and handling, health, and self-care, self-confidence and self-awareness, managing feelings and behavior, and making relationships. These goals were in line with the concept of physical literacy. The physical development domain was in the first place in their kindergarten curriculum in England.

2.3.2.1 The kindergarten PE curriculum in Australia

In Australia, Health and Physical Education was the key learning area in the curriculum that focused explicitly on developing movement skills and concepts. Students were required to participate in physical activities with competence and confidence. *The Australian Curriculum: Health and Physical Education (F–10)* (2014)

was designed to allow schools flexibility to meet the learning needs of all children in two strands of personal, social and community health and movement and physical activity. It addressed the focus areas, content descriptions; and achievement standard in each band of learning from 0 to 10 years. It supported teachers to plan comprehensive and sequential teaching and learning programs that included a balance of health and movement-related learning. Teachers would create opportunities for practical application to enhance the development of knowledge, understanding, and skills across a range of relevant and meaningful health and movement focus areas. Although the HPE documents did not make explicit reference to physical literacy, there were strong alignments between particular interpretations of physical literacy and aspects of the HPE curriculum (Spengler, 2015).

In Australia, the early childhood education curriculum was managed by the local government, which designed the curriculum framework according to the needs of the state. The state curriculum guided and advised kindergartens to design their kindergarten-based health and physical education curriculum while considering the whole education plan of the kindergarten. Different kinds of activities, such as physical games, creative games, and traditional games were used to develop children's body movement (Li, 2007). The Western Australian FMS Teacher Resource Support Package book1(Department of Education, WA, 2013) pointed out five areas that needed to be screened to ensure normal development including balance, bilateral coordination, upper extremity coordination, visual motor control, and upper extremity speed and dexterity. It also showed the tools for learning, teaching, and assessment.

2.3.3 The kindergarten PE curriculum in Canada

In Canada, the provincial regional education department managed the early childhood education curriculum. The framework of preschool physical education curriculum was slightly different, but health and physical education were one of the young children's learning field. Commonly, preschools pay more attention to the development of children's outdoor sports. Hence, outdoor sports activities were on daily schedule no matter wind and rain to get children adapt to the environment. Physical and Health Education (PHE) Canada released *Quality Daily Physical*

Education (QDPE) which was a well-planned school program of compulsory physical education provided for a minimum of 30 minutes per day to all students (kindergarten to grade 12) throughout the school years. QDPE ensured that all children who received it had the opportunity to develop the knowledge, skills, and habits that they needed to lead physically active lives now and in the future. PHE Canada created an interactive wheel based on the acronym EDUCATION to outline the nine principles of physical literacy, which were consistent with a Quality Daily Physical Education program (PHE Canada).

The development of kindergarten PE curriculum in different regions of different countries had its social background and characteristic. All the countries mentioned above pay much attention to PE in the kindergarten, set educational goals, content, teaching strategies, and assessment tools for the PE curriculum in kindergarten to support teachers teaching. Physical literacy was gradually incorporated into kindergarten PE in many countries to aid children to be physically active in life.

2.4 Concluding remarks

The systematic perspective of constructing kindergarten-based PE curriculum was an important direction for future research on kindergarten PE curriculum development in China. There was no PE curriculum standard for kindergarten in China now. Kindergarten PE curriculum developed unevenly and showed the characteristics of diversification, regionalization, and commonality. The theories about movement development offered a broad perspective for teachers to understand the nature and significance of movement for children. The current research on the components of the PE curriculum laid a solid foundation for constructing a kindergarten-based curriculum.

The systematic construction of kindergarten-based PE curriculum was based on the actual situation of the kindergarten, taking the correct curriculum concept as a starting point, and integrating curriculum goals, curriculum content, curriculum implementation and curriculum evaluation as a whole. The philosophy of constructing curriculum should be: establishing a curriculum goal that promoted the whole development of young children, building curriculum content based on preschoolers'

life, emphasizing curriculum implementation characterized by activities and experiences, and implementing a developmental curriculum evaluation (Yu, 2014).

The process of systematically constructing kindergarten-based PE curriculum was a dynamic process in which teachers constantly acted and reflected on the essential components of the PE curriculum. Kindergarten PE curriculum goal should pay more attention to the development of preschoolers as whole individuals and consider how this stage would lay the foundation for preschoolers' active participation in physical activity throughout their lives. Physical literacy has been integrated into the PE curriculum in many countries. The introduction of physical literacy as the goal of physical education would help kindergarten teachers comprehensively understand the goal of kindergarten PE. While emphasizing physical ability, the curriculum content should also focus on preschoolers' affective and cognitive experiences in the process, to foster preschoolers' self-confidence, to highlight preschoolers' understanding of their physical activity, and to creatively use their bodies to express themselves in life. From the perspective of Whitehead, the mastery of a movement skill in itself did not necessarily promote a desire to be involved in activity. Instead, it was the rewarding satisfaction and pleasure generated from any experience in the movement field that created interest in further involvement (Whitehead, 2013). Curriculum implementation should focus on providing a diverse environment and a large number of opportunities so that children could develop in the process of continuous experiences. Curriculum evaluation should emphasize the diversity of evaluation tools; reflect the scientific nature of evaluation; highlight the formative evaluation; to guide children to form positive beliefs through self-ratio and enhance self-confidence, and get the powerful source for lifelong participation in physical activities.

Kindergarten teachers were essential subjects in constructing systematic kindergarten-based curriculum. As designers of the PE curriculum, kindergarten teachers should actively learn the useful experiences of other countries; grasped the theories of preschoolers' movement development; mastered the necessary knowledge and skills of instructing preschoolers' movement; provided preschoolers with rich and varied physical activities, and chose effective strategies to evaluate the PE curriculum.

The combination of learning, action, and reflection would lead kindergarten teachers to actively and effectively participate in constructing the PE curriculum and gain professional development.

Chapter 3 Methodology

The purpose of this chapter is to demonstrate why a complementary mixed-methods design is needed to answer the research questions. The specific methods used to gather data was introduced, and the way to analyze data was elaborated. The research framework and the way to keep the validity and credibility of the study were explained.

3.1 The rationale for the mixed paradigm

The research methodology is the systematic, theoretical analysis of the methods applied to a field of study, or the theoretical analysis of the body of the methods and principles associated with a branch of knowledge (Irny & Rose, 2005). The methodology is the overall approach to research linked to the paradigm or theoretical framework while the method refers to systematical modes, procedures or tools used for collection and analysis of data (Mackenzie & Knipe, 2006). Research in education and the other social sciences are often divided into two main research paradigms: quantitative and qualitative.

Qualitative research is an activity that considers researchers themselves as a research tool; explores the overall social phenomena by using a variety of data collection methods; uses inductive method to analyze data and form theory; and obtains an interpretive understanding of behavior and meaning construction of objects by interacting with the objects in the natural setting (Cheng, 2000). Qualitative methods such as interview, observation, documentary analysis are used to collect qualitative data. Quantitative research is a kind of research to measure and analyze the quantifiable part of a thing and to test the researcher's theoretical research hypotheses on it (Cheng, 2000). Quantitative methods, such as questionnaire survey, experiment, and test are often used to collect quantitative data.

Qualitative research and quantitative research have a significant difference in guiding ideology and operation means. There existed fundamental distinctions between two research paradigms in knowledge claims, strategies of inquiry, and methods of data collection and analysis (Creswell, 2003). Quantitative research is suitable for large-scale investigation and prediction of social phenomena at the macro level, while

qualitative research is more suitable for detailed and dynamic description and analysis of unique phenomena at the micro level. Quantitative research firmly excludes the researcher's influence on the research and tries to achieve value-neutrality. Qualitative research emphasizes the researcher's influence on the research process and results and requires the researcher to reflect on his behavior continually (Cheng, 2000). Qualitative research and quantitative research both have their strength and weaknesses. Qualitative and quantitative approaches can often complement each other.

With the development of qualitative and quantitative research in the social and human sciences, mixed methods research, employing both quantitative and qualitative approaches, has gained popularity. Mixed methods research is a step to utilize the strength of both qualitative and quantitative research (Creswell, 2009). Mixed research takes pragmatism as its philosophical underpinning. Both qualitative methods and quantitative methods were used to collect data. Researchers chose the appropriate approach according to their research questions. Mixed paradigm was used in this study for two reasons:

(1) This study aims to explore the features of systematic PE curriculum underpinned by fostering preschoolers' physical literacy. The process of curriculum development was elaborated step by step. Teachers' ideas about curriculum development were gathered continuously and frequently. Teachers' performance in teaching was observed. The components of the curriculum (goal, content, implementation, and evaluation) were described clearly and scientifically. Interview, observation, and documentary analysis were the appropriate methods. The qualitative paradigm of research could meet all the requirements.

(2) The new PE curriculum was used in Class1, and the old PE curriculum was used in Class3. The primary learning outcomes of two types of curriculum in relation to physical literacy were tested before and after the intervention. The results were compared with each other to show if there was a significant difference. Quasi-experiment and test were the appropriate methods. The quantitative paradigm was appropriate in this manner.

3.2 Research methods

3.2.1 Qualitative methods

Qualitative data deals with descriptions. Three kinds of methods were employed to gather qualitative data in this study.

3.2.1.1 Documentary analysis

Documentary analysis is derived from traditional methods which were mainly concerned with the problems of selection and evaluation of evidence (Judith, 2005). Documentary analysis of files and records can prove to be a precious alternative source of data (Johnson, 1984). As far as the research was concerned, documents of several aspects were carefully collected and analyzed. (1) Policy documents and the syllabus about physical education in SNU Kindergarten were collected to help understand the current PE curriculum in September 2018. (2) Two kindergarten PE teachers' activity plans, four class teachers' activity plans, and one-week curriculum plans were collected to describe the status quo of the PE curriculum in September 2018. (3) The PE teacher's teaching reflections in his class were collected to get more detail information about the effect of the new curriculum from October 2018 to January 2019. (4) The PE curriculum philosophy worksheet (see Appendix C) were gathered from different stakeholders in September 2018.

3.2.1.2 Observation

The distinctive feature of observation as a research process is that it offers an investigator the opportunity to gather 'live' data from naturally occurring social situations (Cohen et al., 2007). Robson (2002) said that what people did may differ from what they said they did, and observation provided a reality check. In this study, A loosely structured, non-participant observation was conducted. 2 PE teachers' physical fitness classes were observed, different physical activities organized by them were observed and recorded according to the *Activity Observation and Analyze Form* from October 2018 to January 2019 (see Appendix A). Class teachers' physical games were observed and field notes were taken.

3.2.1.3 Interview

An interview is a flexible tool for data collection; it enables participants to discuss their interpretations of the world in which they live, and to express how they regarded situations from their point of view (Cohen et al., 2007). In this study, the semi-structured interview and the unstructured interview were used. (1) An unstructured interview was used to interview two PE teachers during the research process. The main questions were about the components of the PE curriculum to get more information that had not been written down. (2) An unstructured interview about curriculum evaluation during and after the implementation process was used to interview two headmasters, two PE teachers, four class teachers. The main questions were about the way to evaluate preschoolers and teachers. (3) A semi-structured interview about organizing physical activity was used to interview seven kindergarten teachers during the research process. Related questions were duly added into the interview process according to the outline questions (see Appendix B).

3.2.1.4 Qualitative data analysis

All three analytic methods mentioned above shared a core analytic framework. Thematic analysis is probably the most accessible of all the analytic forms in qualitative methods. Thematic analysis is a method for identifying, analyzing, describing, and reporting themes founded within a data set (Braun and Clarke, 2006). In this study, the thematic analysis was used to analyze information gathered by three qualitative methods. The thematic analysis method is a systematic interpretation of qualitative data with six stages set out by Braun and Clarke (2006).

Stage 1. Familiar with data: read and read it, and spot the common themes.

Stage 2. generating initial codes: look for the common ideas or patterns that emerge.

Stage 3. Searching for themes: find the commonalities between codes that bring them together.

Stage 4. Reviewing the themes: draw them together to try to form more coherent findings.

Stage 5. Defining and naming themes: to give them names and to finalize what they are.

Stage 6. Producing the report. Illustrate the work with examples from the data, select the example that best encompasses the theme.

3.2.2 Quantitative method

3.2.2.1 Quasi-experiment

Quasi-experimental research is uniquely suited to looking at the effects of an educational intervention, such as a project to improve a specific element or a professional development program (Muijs, 2004, p. 27). Quasi-experimental research designs do have one clear advantage over pure experimental designs, which is that they are studied in natural educational settings. Quasi-experimental research is a right way of evaluating new initiatives and programs in education (Muijs, 2004, p. 29). Quasi-experimental research is designed and carried out in SNU Kindergarten. The main purpose of the Quasi-experimental research is to show the effect of the new PE curriculum on preschoolers' development and teachers' development, to see if the new PE curriculum can improve preschoolers' physical literacy development and teacher's professional development.

Introduction to SNU Kindergarten

SNU Kindergarten is one of the first-class kindergartens in Chengdu City and a model kindergarten in Sichuan Province. It covers an area of 10,000 square meters, including 2,300 square meters of outdoor space. It has more than 80 faculty and staff, and 18 classes with nearly 600 preschoolers. It is a mid-sized kindergarten in Chengdu.

SNU Kindergarten is an affiliated kindergarten of Sichuan Normal University. It is a school placement of the Faculty of Education in Sichuan Normal University. Every semester the students of preschool education in the Faculty of Education in Sichuan Normal University go in this kindergarten to practice teaching. The continues curriculum reform make it a better place for students to learn how to be a good teacher here. As a teacher in the Faculty of Education, the author often goes to this kindergarten and has close relationships with headmasters and teachers there and is familiar with the children and the environment there. It is an advantage to do this research there.

This kindergarten pays much attention to PE and tries to improve the quality of PE all the time. This kindergarten has the advantage to have two professional PE

teachers in PE curriculum development. In recent years, the author has been working with kindergarten PE teachers to improve the PE curriculum of SNU Kindergarten. The author often goes and stays there all day, observing teachers' teaching activities, discussing problems the teachers encountered, exploring solutions to solve the problems with the teachers. In reflecting on the process, things are getting better, but the major problems are still there like in other kindergartens. Kindergarten teachers cared much about how to organize physical activities and ignored the PE curriculum as a system. There was more work to do to improve the quality of kindergarten PE. The headmaster of the kindergarten is willing to put forward PE curriculum reform. That is why this study can be done in it.

Experimental design

This study used a pre-test and post-test between-groups design (Table 3.1). Two parallel groups were chosen in SNU Kindergarten as the experimental group and the comparison group. One PE teacher used the new PE curriculum in the experimental group (Class 1), and the other PE teacher used the old PE curriculum in the comparison group (Class3). Both groups received a pre-test on the same instruments at the beginning of the experiment, and a post-test at the end of the experiment.

Table 3.1 A pre-test & post-test between-groups design

Groups	Pre-test	Experiment controlling	Post-test
experimental group (Class1)	<ul style="list-style-type: none"> • Physical fitness • Basic motor competencies • Perceived physical competence 	<ul style="list-style-type: none"> • The new PE curriculum 	<ul style="list-style-type: none"> • Physical fitness • Basic motor competencies • Perceived physical competence
comparison Group (Class3)	<ul style="list-style-type: none"> • Physical fitness • Basic motor competencies 	<ul style="list-style-type: none"> • The old PE curriculum 	<ul style="list-style-type: none"> • Physical fitness • Basic motor competencies

• Perceived physical competence

• Perceived physical competence

Participants

Children aged 5-6 years in two classes, 2 PE teachers, 4 class teachers in SNU Kindergarten took part in this Quasi-experimental research. Class 1 was the experimental group, and Class 3 was the comparison group. There was some specific information about the participants in two groups in Table 3.2.

Table 3.2 Information about teachers and children in two groups

Groups	Children		Total	PE teachers	Class teachers	Nursery teacher
	girls	boys				
experimental group	18	19	37	Mr. He	Ms. Du & Ms. He	Ms. Chen
comparison group	20	18	38	Mr. Liu	Ms. Ma & Ms. Xiong	Ms. Qin

Variables

Independent variable: The new PE curriculum (see Figure 4.1)

Dependent variable: Preschoolers' Physical fitness, Basic motor competencies, and Perceived physical competence.

Controlling extraneous variable: (1) Two classes were chosen and reasonably determined as the experimental group and the comparison group. The development level of preschoolers' physical fitness, basic motor competencies, and perceived competence was roughly equal in two groups. The number of preschoolers and the sex ratio of the two groups were almost the same. (2) Other factors affecting the experimental effect were controlled. Preschoolers in two groups had the same amount of time to take physical activities each week except for twice physical fitness classes (35minutes). Class teachers organized physical games twice a week (30minutes).

Preschoolers went and played in movement center three times a week (30minutes), and did morning exercise every day (18minutes).

Hypothesis

The general experimental hypothesis is that the new PE curriculum can significantly improve preschoolers' physical literacy development in the experiment group. More specifically:

Hypothesis 1. The new PE curriculum can significantly improve preschoolers' physical fitness.

Hypothesis 2. The new PE curriculum can significantly improve preschoolers' basic motor competencies.

Hypothesis 3. Preschoolers in the experimental group can make accurate judgments about their physical competence.

Hypothesis 4. Class teachers in the experiment group will make progress in making accurate judgments about preschoolers' physical competence.

3.2.2.2 Quantitative data collection

Quantitative data were collected to show children's PL development before and after taking a physical fitness class. There is no universal standard physical literacy assessment tool for educators until now. In this study, according to the features of the curriculum and the ages of the children, preschoolers' physical fitness, basic motor competencies, and perceived physical competence were in relation to preschoolers' PL development. Three kinds of instruments were used to test preschoolers' PL development.

The National Standard Manual for Physical Fitness Measurement (General Administration of Sport, 2003) was selected because it was the most common and reliable tool to test children's physical fitness in China. It includes two parts, physique (height & weight) and physical fitness (10 meters return running, horizontal jumping, throwing, continuously jumping on both feet, sitting and reaching, Balancing). Two PE teachers who have been trained to test preschoolers before conducted the test and one class teacher helped to record the results.

The MOBAK-KG (Herrmann et al., 2018) enables a standardized and economic assessment of basic motor competencies in 4-6-year-old children. The MOBAK-KG test instrument can be used for pedagogical diagnostics (Which children need support?) (Herrmann et al., 2015). The information thus obtained helps preschool teachers to reliably assess the state of learning and achievement of their students (Herrmann et al., 2019). The MOBAK-KG instrument includes a total of eight MOBAK test items to measure self-movement and object movement. Self-movement is covered with four tasks (balancing, rolling, jumping, running) and object movement with four tasks (throwing, catching, bouncing, dribbling). Each of these test items consists of standardized tasks and evaluation criteria (Herrmann et al., 2019). Two PE teachers practiced to test all the items before the formal test, the scoring and administration rules were followed throughout according to the test manual. One class teacher helped to record the results.

Pictorial Scale of Perceived Competence and Social Acceptance (PSPCSA) (Harter & Pike, 1984) for preschool and kindergarten-age children is used to test preschoolers' perceived physical competence. Whitehead (2014) noted that the development of perceived competence was important in the development of physical literacy in relation to motivation to engage in purposeful physical pursuits. The PSPCSA contains four subscales (perceived cognitive competence, perceived physical competence, perceived maternal acceptance, perceived social acceptance) that make up the constructs of perceived competence and social acceptance. For this study, only the perceived physical competence subscale was used. The six items included in this subscale are swinging, climbing, tying shoelaces, skipping, running, and hopping. Reliability for internal consistency of the individual items ranged from .65 to .89, with a reliability of .86 for the combined subscale measure. The reliability of the total scale is .89 (Harter & Pike, 1984).

The physical competence subscale of the PSPCSA was administered to both groups. There are separate pictures for boys and girls, although the activities depicted in each item are the same for boys and girls (Harter and Pike, 1984). The preschooler's task is first to select the picture that is most like himself or herself: one picture depicts

a child who is competent and the other shows a child who is not as skillful. Half of the pictures depicted the more competent child on the left the other half on the right. Then, the preschooler focuses on the designated pictures and indicates whether he or she is just a little bit like that child or a lot like that child (Valentini & Rudisill, 2004). Each item was scored on a four-point scale, where a score of four would be the most competent and a score of one would designate the least competent (see Appendix G) the mean of the scores was calculated for each child (Harter and Pike, 1984). The author practiced using the tool in other classes, then administrated the formal test in the experimental group and the comparison group.

At the same time, class teachers rated preschoolers' physical competence by a rating scale which paralleled the child's instrument. Teachers were given a brief verbal description of each item and rated how true that statement was on a four-point scale (really true, pretty true, only sort of true, and not very true). The scores were used to compare with preschoolers' scores.

3.2.2.3 Quantitative data analysis

Data analysis was conducted by SPSS 22.00 program. The difference of preschoolers' physical fitness and basic motor competencies in two groups were examined through Independence Samples T-test, paired Samples T-test, the relationship among preschoolers' physical fitness, basic motor competencies and perceived physical competence were examined through Pearson correlation coefficient.

3.3 The research framework

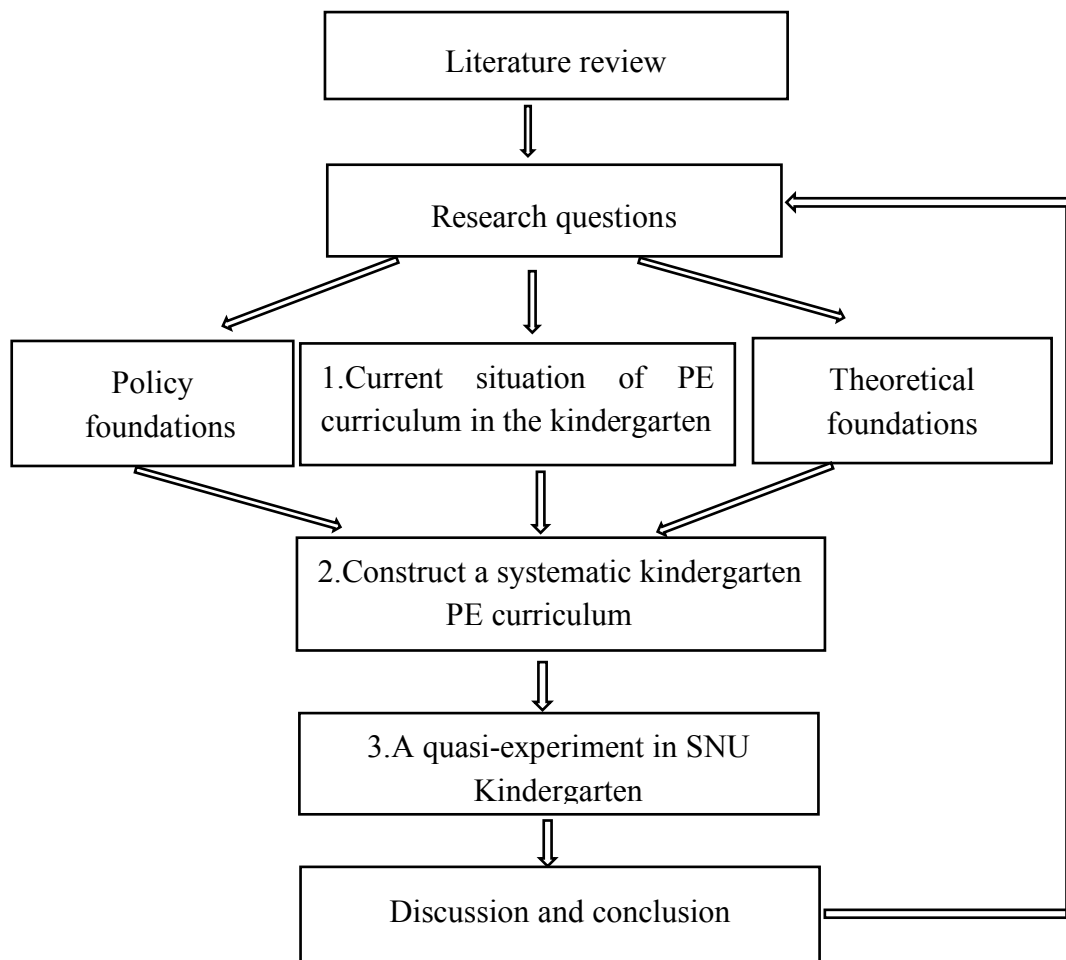
A systematic framework was used to show the whole research ideas of the present study in Figure3.1. Based on the literature review, the research question was put forward, and then the research was done in SNU Kindergarten in Chengdu. The data collection methods included a semi-structured interview, observation, documentary analysis, and test. The research process included three stages.

Stage 1. The current situation of the PE curriculum in the kindergarten was described to explore the advantages, disadvantages, and reasons from March 2018 to September 2018.

Stage 2. The new PE curriculum was constructed by following the ABC model in five steps from September 2018 to October 2018. The idea of following ABC model to refine the PE curriculum underpinned by fostering preschoolers' physical literacy were shared and discussed. Two headmasters, two PE teachers, four class teachers, one expert of curriculum and teaching theory, and one parent involved in this process.

Stage 3, A quasi-experiment was carried out in SNU Kindergarten from October 2018 to January 2019. Children's physical fitness, motor competence, perceived physical competence were tested as a pre-test in October 2018. PE teacher in the experiment group used the new PE curriculum from October 2018 to January 2019. Children's physical fitness, motor competence, perceived physical competence were tested again as post-test in January 2019. Then came to the discussion and conclusion part to respond to the research questions.

Figure 3.1 The research framework



3.4 Validity and credibility of the research

3.4.1 Triangulation

Triangulation may be defined as the use of mixing methods of data collection in the study of some aspect of human behavior (Louis et al., 2007) so that diverse viewpoints cast light upon topic (Olsen, 2004). Triangulation is a powerful way of demonstrating concurrent validity in mixed methods research (Gall, Gall, & Borg, 2007). Triangulation was employed in this study. Four data collection methods were utilized including documentary analysis, interview, observation, and test. The data was acquired from multiple stakeholders such as class teachers, PE teachers, headmasters.

3.4.2 Member checking

Lincoln & Guba (1985) suggest that credibility in naturalistic inquiry can be addressed by member checking. Member checking is used to assess intentionality; to correct factual errors; to offer respondents the opportunity to add further information or to put information on record; to provide summaries and to check the adequacy of the analysis (Lincoln & Guba, 1985). In this study, member checking was carried out like this: after the interview, the transcripts of the interview were sent to the respondents to ensure the accuracy of the transcripts, then asked them to write down if they thought there was more information to add.

3.5 Ethical considerations

Ethical issues may originate from the kinds of problems investigated by social scientists and the methods they use to obtain valid and reliable data (Louis et al., 2007, p. 51). In this research, the following procedures were taken to ensure that the study was ethical.

(1) A meeting was held before the research. All stakeholders participated in it to understand the purpose and the procedures of the research, the benefits, the possible consequences, and the duties of the participants. All the participants consented to take part in the research. (2) Class teachers informed parents in parents meeting and let the parents know the information about the research. The participants' right to privacy was

respected. Agreement from teachers and parents were acquired about taking photos, recordings, and tests children' development. (3) Confidentiality was maintained in this research. The identity of all participants was kept anonymous.

Chapter 4 The research results

The purpose of this chapter is to answer the research questions according to the research process. It contains four parts. Part one, the current situation of the kindergarten PE curriculum in SNU Kindergarten is described, to show what needs to be done to improve it. Part two, the current kindergarten PE curriculum (the old kindergarten PE curriculum) is refined and a systematic PE curriculum (the new kindergarten PE curriculum) is constructed. Part three, the new PE curriculum is compared with the old PE curriculum, to show what are the features of the new PE curriculum. Part four, a quasi-experiment is conducted in SNU Kindergarten in one class, to show how does the new kindergarten PE curriculum work.

4.1 The current situation of the kindergarten PE curriculum in SNU Kindergarten

This part described the old PE curriculum system in SNU Kindergarten, to show what it looked like, what was right to continue, what needed to be improved, and the reasons. Documentary analysis, observation, and interview were used to gather information.

4.1.1 The current PE curriculum in SNU Kindergarten

From the systematic perspective of PE curriculum, it contained goal, content, implementation, and evaluation. All the components should be consistent with the educational philosophy of the kindergarten. The situation of all components was explored step by step.

4.1.1.1 The basis for kindergarten teachers to construct the PE curriculum

There is no national standard for kindergarten PE in China. Kindergarten teachers have to find evidence by themselves to construct the PE curriculum. According to the interview information, PE teachers constructed the PE curriculum according to different resources, parts of them were listed in Table4.6. They gathered information from government policies, books, videos, and lectures to construct the PE curriculum.

They paid attention to the practical books and videos which could give them direct instruction and inspiration to organize physical activities. According to the resources they accessed, the environment of the kindergarten, and preschoolers’ actual standard, PE teachers constructed their kindergarten PE curriculum “in their mind.”

4.1.1.2 The goal of the old PE curriculum

When talked about the goal of PE, PE teachers claimed that: “*the general goal of PE in this kindergarten is to improve preschoolers’ physical fitness, to develop their FMS, and to cultivate their interest and habits to physical activities*” (PET1³ PET2). These goals were in PE teachers’ mind, and they did not write down them in the documents of the kindergarten PE curriculum.

The specific objectives of PE for K1, K2, k3, were written down in the “*Objectives and guiding points of physical activities*” which offered by the PE teachers and was the only document in the kindergarten to tell the goals of PE. It contained the objectives of different motor skills for preschoolers to achieve and the guiding points for teachers to use in teaching. The objectives described all the motor skills which were needed to be developed in different ages and the possible results. The objectives for K1, K2, K3 were listed in Table4.1.

Table 4.1 The objectives and content of PE for k1,k2,k3

Objectives	• Specific objectives for k1	• Specific objectives for k2	• Specific objectives for k3
• Walking	• Walk naturally • Walk in a fixed direction	• Walk with rhythm • variable speed walking	• Walk in curve route
• Running	• Run naturally	• Run naturally	• Run in curve route

³ PET is a symbol used in this study, PET1, PET2 are used to present different PE teachers.

	<ul style="list-style-type: none"> • Walk and run alternatively (100m) • Run in a fixed direction • Chasing run 	<ul style="list-style-type: none"> Walk and run alternatively (200m) Variable speed running • Run fast (20m) • Chasing run 	<ul style="list-style-type: none"> • Walk and run alternatively (300m) • Run fast (30m)
• Jumping	<ul style="list-style-type: none"> • Vertical jump • Jump from height (25cm) • Moving jump 	<ul style="list-style-type: none"> • Constantly vertical jump to touch (25cm) • Jump from height (30cm) • Horizontal jump (30cm) • Run-up cross jump (40cm) 	<ul style="list-style-type: none"> • Constantly vertical jump to touch (25cm) • Jump from height (35cm) • Horizontal jump (40cm) • Run-up cross jump (50cm)
• Throwing	<ul style="list-style-type: none"> • Throw far 	<ul style="list-style-type: none"> • Throw far 	<ul style="list-style-type: none"> • Throw far (4m) • Throw accurately (3m, 60cm)
• Balancing	<ul style="list-style-type: none"> • Balance walking 	<ul style="list-style-type: none"> • Balance walking (width: 20cm, height: 30cm) • Rotate with eyes closed (3 circles) • Walking with eyes closed (10m) 	<ul style="list-style-type: none"> • Balance walking (width: 15cm, height: 40cm) • Rotate with eyes closed (5 circles) • Standing on one foot (more than 5s)
• Crawling	<ul style="list-style-type: none"> • Crawling 	<ul style="list-style-type: none"> • Crawling 	<ul style="list-style-type: none"> • Crawling
• Rolling		<ul style="list-style-type: none"> • Backward Rolling 	<ul style="list-style-type: none"> • Forward rolling
• Bouncing	<ul style="list-style-type: none"> • Bounce a ball 	<ul style="list-style-type: none"> • Bounce a ball 	<ul style="list-style-type: none"> • Bounce a ball
• Catching		<ul style="list-style-type: none"> • Throw and catch • Catch with both hands 	
• The Queue	<ul style="list-style-type: none"> • Walk one by one into a circle 	<ul style="list-style-type: none"> • Walk from one column to two 	<ul style="list-style-type: none"> • Fall in column

The “*guiding points*” described how different motor skills should be done in different ages, and pointed out the aspects that teachers should guide in the teaching process. Taking the guiding point for “run fast” as an example: “*Emphasize that legs step on the ground firmly, arms swings fully, big strides, the frequency must be fast, arms swing forcefully, upper body leans forward, eyes look forward.*” This guiding point showed how all the body parts should do in “run fast”. In the teaching process, teachers could teach preschoolers how to run fast by demonstrating the desired performance of the skill and describing it in words according to the guiding points. It was helpful for preschoolers to understand how the motor skill should be done. It was also helpful for class teachers to judge whether preschoolers’ movements were accurate or not, and what aspects should be adjusted.

4.1.1.3 The content of the old PE curriculum

From Table 4.1, the “*Objectives and guiding points of physical activities*” also showed the content of kindergarten PE, which mainly included the motor skills and queue practice. It only listed all the content. However, it did not tell what content must be taught; when would the content be taught, and how much time would spend.

4.1.1.4 The implementation of the old PE curriculum

In the implementation part of the PE curriculum, the kindergarten put forward relevant rules on organizing physical activities. The vice headmaster talked about the rules to organize physical activities in the kindergarten. The rules emphasized the time and types of physical activities.

“Kindergarten teachers should make sure that preschoolers have at least one hour to do physical activities every day. Different types of physical activities should work together to improve preschoolers’ whole development. Normally, Preschoolers do morning exercise (basic gymnastics) every day for 10-18 minutes. They take part in physical fitness class once a week in K1 for 25-30 minutes, twice a week in K2, and K3

for 30-35 minutes. They take part in physical games twice a week for nearly 30 minutes. They go and play in the movement center at least three times a week for nearly 30 minutes each time. After snapping, they have 15 minutes to do physical activities in the classroom. (Interview vice headmaster, 14.9,2018)

From teachers' weekly schedules, it was found that most kindergarten teachers tried to arrange time for children to do physical activities at least one hour every day. Teachers offered structured and unstructured physical activities for children to play. It was suitable for children's development. However, according to observation, physical activities would be diminished sometimes for some reasons, such as bad weather, festival celebrations, medical examination, receptions, and PE teachers' leaving for study.

Though preschoolers had different physical activities every week in kindergarten, physical fitness class was one of the most important activities which took the critical place in the PE curriculum. Kindergarten PE teachers' work also had a great effect on fostering preschoolers' physical literacy. In this study, the author mainly discussed the construction of the kindergarten PE curriculum with PE teachers' work as the main line.

PE teachers concentrated on effectively designing physical activities and organizing physical activities fluently to create an instructional environment to develop preschoolers' motor skills and foster a positive attitude to a healthy lifestyle. From the perspective of Dynamical Systems Theory, the learner, the task, and the environment are the main factors that affect motor skill acquisition. Boyce (2009) emphasized teacher's duty in creating the instructional environment: "A physical educator's primary responsibility was to create a classroom environment that enhanced motivation and encouraged students to become fit and to learn motor skills (p. 49)."

The research on motivational climate stemmed from achievement goal theory. According to Ames (1992a, 1992b), there were two types of motivational climates: mastery (task-involvement) goal orientation and performance (ego-involvement) goal orientation. Central to mastery goal orientation was to believe that effort would lead to personal progress and mastery; more effort lead to more ability and success (Valentini

et al., 1999). Mastery goals increased the amount of time that children spent on learning tasks (Butler, 1987), and their persistence in the face of difficulty (Elliott & Dweck, 1988). Central to performance goal orientation was a focus on one's ability and sense of self-worth (Dweck, 1986).

The nature of children's experiences and how they interpreted these experiences influenced the degree to which they adopt a mastery or performance orientation (Valentini & Rudisill, 2004). A mastery goal elicited a motivational pattern that was associated with a quality of involving to maintain achievement behavior, whereas a performance goal fostered a failure-avoiding pattern of motivation (Elliott & Dweck, 1988, Nicholls et al., 1989). With a mastery goal, individuals were oriented toward developing new skills, trying to understand their work, enhancing their level of competence, or achieving a sense of mastery based on self-referenced standards (Ames, 1992b), preferring challenging work (Elliott & Dweck, 1988), and arousing an intrinsic interest in learning activities (Butler, 1987). When mastery goals were adopted, pride and satisfaction were associated with successful effort (Jagacinski & Nicholls, 1987). With a performance goal, individuals were oriented to show their ability evidenced by doing better than others, by surpassing normative-based standards, or by achieving with little effort (Ames, 1984).

Most of the studies in creating mastery climates were theoretically grounded in Epstein's (1988, 1989) and Ames' (1992a, 1992b) research. Epstein (1988, 1989) proposed that a comprehensive plan for influencing children's motivation over the long term could be achieved by identifying principles and strategies based on six dimensions of the learning environment, known as the TARGET (task, authority, recognition, grouping, evaluation, and time) structure. TARGET showed the role of the teacher in these six structures (Epstein, 1989, p. 259-295): (1) Teachers identified the tasks that their students would perform during class (task). (2) Teachers decided who would make the instructional decision — the teacher, the students, or both (authority). (3) Teachers determined how rewards would be given (recognition). (4) Teachers designated how students would be grouped for activity (grouping). (5) Teachers determined how

students would be assessed (evaluation). (6) Teachers decided on the lesson's pace and the amount of time devoted to task completion(time).

The features of the mastery climate and performance climate in relation to TARGET were different (Table 4.2, Ames, 1992b). Briefly, the six structural features of mastery climate were (Boyce,2009 p. 50): (1) Teachers used a variety of class activities based on students' abilities that were challenging individual students to excel at their level. (2) Teachers let students make some of the instructional decision makings and assume leadership roles. (3) Teachers delivered rewards privately and based these rewards on personal improvement. (4) Teachers grouped students heterogeneously to promote cooperative learning and peer interactions. (5) Teachers evaluated students based on personal improvement and mastery of tasks. (6) Teachers varied the pace of the class time based on students differing time requirements for mastery of a giving task. In contrast, the features of a performance climate were: (1) Teachers presented the same tasks regardless of differing student abilities. (2) The classroom was teacher-centered. (3) Teachers rewarded student publicly based on social comparison. (4) Teachers grouped students in diverse ways to promote cooperative learning and peer interactions. (5) Teachers evaluated students' performance based solely on the outcome. (6) Teachers paced the class activities and decided on the time allocated for skill or fitness practice by an inflexible curriculum plan.

Table 4.2 Description of mastery and performance climates in relation to TARGET

Structure	Mastery climate	Performance climate
• Task	• Challenging and diverse activities	• No-challenging activities with little variety
• Authority	• Students have choice and leadership role	• Teacher makes all instructional decisions
•Recognition	• Based on improvement and giving privately	• Based on social comparison and the public given
• Grouping	• Cooperative learning and peer interactions	• Groups are formed based on skill and fitness level
• Evaluation	• Based on task mastery and improvement	• Based on winning or outcome performance

- Time requirements adjusted based on personality
- Time allocated for learning is the same for all students

Resource: from Ames (1992b)

According to the description of performance climate offered by Valentini (1997), PE teachers tended to create a performance climate in traditional physical fitness classes in most kindergartens in China. Table 4.3 showed the description of performance climate in relation to TARGET class structure.

Table 4.3 The description of performance climate in relation to TARGET

Structure	Description
•Task	<ul style="list-style-type: none"> • Five activity stations were set-up by the teachers. • One level of difficulty or challenge within each activity station was provided. • Teachers chose activities in which participants engaged. • Few opportunities for novelty, creativity, and to vary the task existed.
•Authority	<ul style="list-style-type: none"> • There was little or no autonomy or distribution of authority. • Limited collaboration between teachers and participants for creating rules and lesson objectives occurred. • Teachers directed engagement in physical activities. • Participants had no freedom of choice (i.e., low autonomy).
•Recognition	<ul style="list-style-type: none"> • Recognition was based on outperforming others, achieving normative standards of success, commanding directions, or reprimands for a rule violation. • Recognition and feedback were given in front of other participants.
•Group	<ul style="list-style-type: none"> • Teachers assigned participants to groups. • Groups remained the same throughout each activity session and rotated from station to station as a unit.
•Evaluation	<ul style="list-style-type: none"> • The Evaluation was based on winning, performance outcome, and outperforming other participants. • Participants were evaluated irregularly. • Evaluations were made in public and were also naturally embedded within the activity stations.

-
- Time
 - The timing was on a fixed schedule rotation (e.g., 5 min per activity station)
 - Teachers dictated time allotted per station.
 - Participants were allotted the same amount of time for engagement and skill practice

Resource: adapted from Valentini (1997)

Here were the specific features of performance climate in kindergartens in China.

Task

Teachers laid out the play equipment and set up the playing setting before the class. During the teaching process, the task would be changed in difficulty level step by step. All children were allowed to participate in one level at the same time, then the next. They were all expected to complete the task precisely as described by the teacher no matter what was their level. The lack of variation in challenge level might lead participants, especially those who were less skilled, to experience more failure (Nicholls, 1984).

Authority

Children had little or no autonomy to involve in instructional decision-making. In most of the time, children must follow teachers' directions and instructions with little opportunity to make decisions about their movement exploration. Children were expected to follow the teachers' rules for engagement and instructions regarding the task. If some of them were naught to break the rules, they would be punished (e.g., lose the chance to play). In the performance climate, teachers provided direct instruction, and the children acted as an agent of control and have little autonomy.

Recognition

The recognition was given in the teaching process and focused on recognizing performance based on performance outcomes and the performance of others. Teachers recognized children for outperforming someone else, for concentrating on physical activities, for breaking the rules. Most recognition was given in public as an excellent model to be learned by others or as a wrong model to be avoided.

Group

Typically, teachers randomly assigned each participant to a group if the children needed group work. Sometimes groups were identified by girls or boys. Sometimes children could choose which group they wanted to join in. The groups remained the same throughout physical activity.

Evaluation

Evaluation in performance climate condition emphasized children's performance outcome, winning, and outperforming other children. Teachers made performance evaluation in public and also naturally embedded within the teaching process.

Time

The time of physical fitness class was 35 minutes for children aged 5-6 years. The teaching process was divided into several parts, and the time was fixed in each part. Warming up part was 5 minutes, the body part was 27 minutes, relaxing part was 3 minutes. In the body part, teachers prepared different activities for children to take part in, the activities were arranged from easiness to difficulty. All children were allowed to engage in the same physical activities at the same time, regardless of their skills or physical fitness level. Sometimes teachers wasted their time trying to keep teaching in order. Sometimes children wasted time to wait for their turn to play.

4.1.1.5 The evaluation of the old PE curriculum

Kindergarten PE curriculum evaluation was a necessary means to deepen PE curriculum reform and improve the quality of PE. There were different kinds of curriculum evaluation to achieve different purposes. The formative evaluation focused on the process and interpreted why specific results occurred. The purpose of formative evaluation during the implementation was to diagnose and revised it. The summative evaluation focused more on the overall outcomes of instruction over time. The purpose of summative evaluation after implementation was to judge the effect of the curriculum. The subjects of the evaluation could be educational administrators, headmasters, teachers, children, and parents in the kindergarten.

Different stakeholders chose descriptive ways to do a formative evaluation in curriculum implementation. The evaluation of the kindergarten curriculum mainly

includes: “ understanding children’s reaction in activities ; teachers’ attitude and behavior ; quality of teacher-children interaction; learning environment ; the effectiveness of the curriculum implementation (wang, 2018).

The evaluation of PE curriculum was relatively weak and random in SNU Kindergarten. There was no systematic PE curriculum in kindergarten, and then there were no formal strategies to evaluate program development. However, according to the interview of headmasters and kindergarten teachers, they still did a free evaluation on preschoolers’ development and teachers’ development based on their experience from their viewpoints (Table 4.4, Table4.5).

In the formative evaluation process (Table 4.4), headmasters, PE teachers, and class teachers all cared about both preschoolers learning and teachers teaching in the activities. For preschoolers’ learning, they focused on preschoolers’ reaction, such as their safety (H1, PET1,C T1, C T3, C T9), interest (H2, PET1, PET2, C T1, C T3, C T9), participation level (H1, PET1, CT1, C T8, CT3, CT9), and movement amount (PET1, PET2) . For teachers teaching, they focused on teachers’ attitude and behaviors, such as their attention to individuals (H1, H2), goal appropriate (H2), effective control of the class (PET2, H1, H2, CT1, CT8, C T3), teacher-children interaction (H1, H2, PET1, CT9). They also focused on teaching effectiveness, such as children’ mastery of movement skills (PET1) and teachers’ goal achievement (H1, H2, CT8, CT9).

Table 4.4 Evaluation in curriculum implementation

Evaluation subjects	Evaluation content	Evaluation points
•Headmasters (H ⁴)	•Children’s reaction	•Children’s safety (H1) •Children’s interest (H2) •Children’s participation level (H1)
	•Teachers’ attitude and behavior	•Teachers’ goal appropriate (H2) •Teachers’ attention to individuals (H1, H2) •Teachers’ effective organization (H1, H2)

⁴ H is a symbol used in this study, H1, H2 are used to present different headmasters.

		<ul style="list-style-type: none"> •Teachers' professional level (H1) •Teacher-children interaction (H1, H2) •Teachers' goal achievement (H1, H2)
	•Teaching effectiveness	
•PE teachers (PE T)	•Children's reaction	<ul style="list-style-type: none"> •Children' movement amount (PE T1 , PE T2) •Children's participation level (PE T1) •Children's interest (PE T1, PE T2) •Children's safety (PE T1, PE T2)
	•Teaching effectiveness	•Children' mastery of movement skills (PE T1)
	•Teachers' attitude and behavior	<ul style="list-style-type: none"> •Effective control of the class(PE T2) •Teachers' goal appropriate (PE T1) •Teacher-children interaction (PE T1) •Teachers' professional level (PE T1)
•Class teachers (CT ⁵)	•Children's reaction	<ul style="list-style-type: none"> •Children's participation level (CT1, CT8, CT3, C T9) •Children's interest (C T1, C T3, C T9) •Children's safety (C T1, CT3, C T9)
	•Teaching effectiveness	•Children's improvement (CT8, CT3, CT9)
	•Teachers' attitude and behavior	<ul style="list-style-type: none"> •Teachers' goal achievement(CT8 , CT9) •Effective control of the class(CT1, CT8, C T3) •Teachers' attention to individuals (CT9)

In the summative evaluation (see Table 4.5), headmasters, PE teachers, and class teachers all cared about both preschoolers' development and teachers' development after teaching. They evaluated teachers' development from content of teachers' observation records (H1), their systematic plan for PE (PET1), their teaching reflection (H1, H2, PE T1, CT1, CT3), their teaching goal system (H2, PE T1), their activity

⁵ CT is a symbol used in this study, CT1, CT2 are used to present different class teachers.

displaying and sharing (H1, CT8, CT9), and their instruction for class teachers (CT1). They evaluated preschooler' development from the content of preschoolers' interest (H2, PET1, PET2), their physical fitness (H2, CT1, CT8, CT3, CT9), and their self-evaluation ability (PET1). They evaluated preschoolers' development by ways of testing part of preschoolers in sports meeting (PET2), testing preschoolers' physical fitness (PET1, CT8, CT3), and observing preschoolers mastery of motor skills (PET1, CT8, C T3).

Table 4.5 Evaluation after curriculum implementation

Evaluation subjects	Evaluation content or ways	Evaluation points
•Headmasters (H)	•Children's development (content) •Teachers' development (content)	•Children's interest in the physical fitness class (H2) •Children's physical fitness development(H2) •Teachers' observation records for children (H1) •Teachers' teaching reflection (H1, H2) •Teachers' activity display and sharing (H1) •Teachers' goal system for different ages (H2)
•PE teachers (PE T)	•Children's development (content) (ways) •Teachers' development (content)	•Children's interest in physical fitness class (PE T1, PE T2) •Children' self-evaluation ability (PE T1) •Children's score in sports meeting (PE T2) •Children's physical fitness test (PE T1) •Children' mastery of motor skills (PE T1) •Teachers' reflection on their teaching (PE T1) •Teachers' systematic plan for PE (PE T1)
•Class Teachers (CT)	•Children's development (ways)	•Children's physical fitness test (CT1, CT8, CT3, CT9) •Teachers' observation records for children (CT8, C T3)

- | | |
|--|--|
| <ul style="list-style-type: none"> •Teachers’ development (content) | <ul style="list-style-type: none"> •PE teachers’ goal system for different ages (CT1, CT3) •PE teachers’ instruction for class teachers (CT1) •PE Teachers’ ability to organize activity (CT8, CT9) |
|--|--|
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4.1.2 The reflection on the current PE curriculum

There was no unified PE curriculum text in SNU Kindergarten. Kindergarten PE teachers integrated information from many sources to construct their own PE curriculum “in their mind”. They had accumulated rich experiences in teaching. However, these experiences were in their mind. They did not seriously summarize and organize them into text. Consequently, the PE curriculum was in an imperfect state.

The philosophy of the PE curriculum was not clearly stated. The values of PE were not discussed and understood by teachers soundly. Kindergarten teachers, especially class teachers did not realize the real values of PE to preschoolers. That was why some teachers thought it did not matter for them to cancel preschoolers’ physical activities in daily life. There were not authoritative rules to guarantee the quality of physical activities.

The goals of the PE curriculum were not comprehensive. From the syllabus, the goals of PE focused on the physical part of preschoolers’ development, ignoring the cognitive and affective parts. The current goals of the PE curriculum could not afford preschoolers whole development. Furthermore, the objectives described in different ages that needed to be checked. Some of the objectives were not suitable for the preschoolers’ ages. For example, the objective of “*Horizontal jump*” for children aged from 5-6 is “*can jump no less than 40cm*”. It was vague. The target was too low to challenge children of this age. The goals and objectives of the PE curriculum should be carefully decided according to the current situation of preschoolers. The guiding points needed to be changed in a simple way, then teachers could use them to evaluate preschoolers’ achievement.

The content of the PE curriculum was generally listed. The arrangement of the content was not sure. It did not tell which content should be arranged in the first semester and which in the next semester. The turns of the content should be decided ahead of time. It would be convenient for different teachers to discuss and arrange the content according to the materials of the kindergarten.

In curriculum implementation, the kindergarten rules were helpful to guarantee the amount of time for preschoolers to take part in different physical activities. All kinds of physical activities were good for preschoolers' development. Physical fitness class organized by PE teachers had a great effect on preschoolers' development. PE teachers had a clear goal to organize physical activities, but frequently, they chose to create a performance climate in teaching. According to the observation, in this kind of climate, preschoolers could not get enough chances to develop themselves. A mastery motivational climate needed to be created to change the current situation.

The PE teacher was in absolute authority place. He stood in front of the preschoolers most of the time. He spent much time on keeping the "good" teaching order. He had less time to give individual feedback to preschoolers. Preschoolers did not have freedom for choice. They had to spend much time waiting for their turn to play. It was difficult for them to wait for a long time but play for a short time. Then some of them did not concentrate on their tasks sometimes. In fact, "waiting phenomenon" was widespread in PE class or physical games; things needed to be done to change this situation (Field notes.18.12.2018).

Other kinds of activities organized by class teachers were good supplementary of physical fitness class. However, the quality of these kinds of activities was worrying from the interview with class teachers. They did not know the specific goals of PE, and they cannot organize physical games and movement center activity effectively.

*"I do not know the exact goals of PE(C T1, C T2, C T4, CT5, CT6, CT 7) ."**"I organize activities according to the observations in daily life. When I design the physical games, it is a challenge to arrange the process to achieve the objectives step by step like PE teachers(CT2). The quality of physical activity is not high (C T2, CT6)."*

“It is not easy to keep children’s interest in physical games, and I often lose the objectives when children shift their interest(CT2, CT3, CT6).” “I hope that PE teachers can plan the overall goals for K1, K2, K3, and hand it to us (C T1, C T2, CT5).” “Then, I can use it to observe children’s development and try to take actions to improve it (C T1, CT5).” (Interview class teachers, 9, 2018)

“Class teachers are not good at organizing physical games, we usually find physical games on the internet (CT1, CT2, CT3, CT4, CT5, CT6), but the games are often not fit for the preschoolers’ development level of our class(CT5, CT6), and sometimes preschoolers do not like them (CT4, CT6).” “I hope that PE teachers can provide us with examples so that we can quickly learn how to organize good physical games(C T2, CT3, CT6).” “I do not know how to use the limited equipment effectively to keep preschoolers developing evenly (CT1, CT2 ,CT5, CT6, CT7).” “There are too many preschoolers in my class, I worry about their safety in movement center, and I cannot give professional instruction to them (CT2, CT4, CT7).” “Class teachers lack professional knowledge and skills of PE, we all have great pressure to keep children’s safety in physical activity, so we try to forbid preschoolers’ risky play, even though they love it very much. Safety is the first (CT1, CT5, CT6).” “I want more professional training(CT7).” (Interview class teachers, 9, 2018)

PE teachers and class teachers should cooperate tightly. PE teachers have professional knowledge in their mind, and they have the ability and necessity to offer clear PE goals for all the class teachers. They need to think about how to guide class teachers’ work on physical activities by training their motor skills, giving direct instructions, and showing good examples to them. So that the physical activities organized by class teachers could become an extension of physical fitness class. Class teachers need to learn from PE teachers actively, make clear the goal of PE, and organize physical activity effectively.

It was necessary to strengthen curriculum evaluation to enhance preschoolers’ development, teachers’ development, and program development. There were no clear

rules on the PE curriculum evaluation in this kindergarten. There was no uniform effective tool for evaluation in it. Different stakeholders did the evaluation on their own perspectives. Although they knew evaluation was necessary. It was not easy for them to evaluate as they believed. They could not evaluate preschoolers' development and teachers' development regularly and effectively. They did not evaluate the PE curriculum development. Some formal evaluation strategies should be discussed carefully to make them be used in a realistic environment, to achieve developmental evaluation.

In general, the current kindergarten PE curriculum was imperfect. The components of the PE curriculum were vague. A systematic PE curriculum needed to be constructed to promote the quality of the physical activities in the kindergarten, and to improve preschoolers' development and teachers' development. The process of constructing the PE curriculum was a process of continuous improvement based on the existing foundation of the kindergarten.

4.2 The process of constructing the new kindergarten PE curriculum

It was difficult for kindergarten teachers to construct the PE curriculum without instruction. That was why most of the kindergartens did not have a systematic PE curriculum. University teachers, headmasters, kindergarten teachers, parents should involve in this process. In this study, different stakeholders gathered together and tried to construct a PE curriculum in SNU Kindergarten for children in K3. The ABC model provided a process for teachers to collect all the information to construct a systematic PE curriculum.

The PE curriculum committee was built for curriculum reform according to the ABC model. It was composed of the following members: Ms. Lu (the headmaster), Ms. Cai (vice headmaster), Mr. He (PE teacher), Mr. Liu (PE teacher), Ms. Li (the teacher leader for k3), Ms. Li (class teacher), Ms. Gong (class teacher), Ms. Gong (parent), Ms. Peng (curriculum specialist in university), and Ms. Duan. The author acted as the intermediary in the whole process.

Based on the authoritative policies about children's development in China, theories about children's motor development, PE curriculum development, and the

current situation of PE curriculum in SNU Kindergarten, kindergarten PE curriculum was constructed according to the components of ABC model step by step. Many learning resources were gathered and shared by committee members to prepared for constructing the PE curriculum; the most important parts of them were listed in Table 4.6.

Table 4.6 PE teacher's learning resources in constructing PE curriculum

Types of resources		Part of Examples
•Documents	•Authoritative Policies in China	<ul style="list-style-type: none"> • Guidelines of Learning and Development for Children Ages 3-6 (2012). • Kindergarten Work Procedures (new) (2016). • Guidelines of Sports for Children Ages 3-6 (2018)
•Books	<ul style="list-style-type: none"> •Theoretical books on motor development •Theoretical and practical books about curriculum and PE curriculum in kindergarten 	<ul style="list-style-type: none"> • Key Experiences in Movement for Young Children. (Weikart,2000) • Introduction to Human Motor Development (Payne,2008) • Understanding Motor Development: Infants, Children, Adolescents, Adults. (Gallahue,2012) • Physical Literacy: Throughout the Lifecourse (Whitehead,2010) • Developing the Physical Education Curriculum (Kelly,2004) • The Basic Principle of Curriculum and Instruction (Tyler,2013) • Kindergarten Curriculum (Yu,2014) • The Kindergarten Physical Education (Liu,1998) • Physical Education for Preschool Children (Xu,2003) Kindergarten Health Education (Gu & Xue,2004) • Core Experience in Preschoolers' Healthy Learning and Development (Liu,2016) • Design and Guidance of Kindergarten Physical Activities. (Wang, 2011)

- Kindergarten Excellent Physical Activity Design (Zhu, 2015)
- Moving with Words & Actions: Physical Literacy for Preschool and Primary Children (Clements & Schneider, 2017).
- Physical Literacy on the Move: Games for Developing Confidence and Competence in Physical Activity(Heather, 2017).
- KDL Movement Game Curriculum for Kindergarten (Wang, 2018)

•Articles	• Articles about Physical Literacy, Physical activity, Physical Education (all of are listed in reference)
•Videos	• Videos download from internet or recorded from visiting different kindergartens.
•Lectures	• Academic meeting about physical education.

4.2.1 Program planning

The program planning is a process of deciding what we should teach in PE in kindergarten and why from day to day year to year in PE (Kelly et al., 2004, p67). This process will result in four products:

1. The reflection of the philosophy of kindergarten PE.
2. The functional goals that will be achieved by all preschoolers who participate in the PE program and that reflect the philosophy of the school and community.
3. Specific measurable objectives need to achieve each of the program goals and the operational definition of all objectives in terms of both process and product measures.
4. The sequencing of specific content needs to be taught in a semester.

4.2.1.1 Developing the program philosophy

In developing the philosophy of kindergarten PE, a meeting about the PE curriculum reform was held, all the PE curriculum committee members joined the

meeting to know and share the main ideas of PE curriculum reform. Then a PE curriculum philosophy worksheet (Appendix C) was created and handed out to all members to solicit the information that needed to write a philosophy statement. Three main questions were answered in the statement (Why do preschoolers need PE? How will they benefit from it? What is the goal of PE?). After gathering the information by the worksheet, a draft philosophy statement was developed by the author and reviewed by all members; then a final philosophy statement was formed as follows (Table 4.7):

Table 4.7 Physical education philosophy

SNU Kindergarten Physical Education Philosophy Statement

PE in the kindergarten is an integrated part of the overall kindergarten curriculum and an essential part for preschoolers to be whole children. The benefit of physical activities for preschoolers (3-6years) was declared in *Preschoolers' Physical Activity Guidelines* (2018): “it is a benefit for preschooler’s growth and health; environmental adaptation, cognitive, emotional, and psychosocial development; FMS, and lifelong exercise habits.” The physical activity-related health benefits for children from 3-6 was firstly demonstrated in Scientific Report (2018). “ Strong evidence demonstrates that higher amounts of physical activity are associated with more favorable indicators of bone health and with reduced risk for excessive increases in body weight and adiposity in children ages 3 to 6 years.” (Scientific Report, 2018). Physical activity is urgent than before because of the decline of physical activities, the increase of obesity and overweight numbers, and a large number of children with nearsightedness. PE is a meaningful way to guarantee a high amount of physical activities in kindergarten.

To guarantee the quality of physical activities, SNU Kindergarten requires that physical fitness class must be provided for all preschoolers aged from 5-6 years by certified physical teachers twice a week, 35 minutes each time. In addition, preschoolers have about 20 minutes to do morning exercise every day. Preschoolers are provided with physical games organized by class teachers, twice a week, 30 minutes once. Preschoolers have at least three times to go and play in different movement centers, 30 minutes once. Preschoolers have 15 minutes to do creative physical activities after snapping.

Kindergarten should offer enough apparatus for kindergarten teachers to organize a variety of physical activities for preschoolers. The headmaster should do a good job in publicity so that more parents can understand the value of physical activities and support kindergarten teachers to carry out effective physical activities. The headmaster should offer chances for teachers to learn outside to improve teacher development in this domain. PE teachers should offer the goals of PE and guide class teachers to integrate all the physical activities to improve the quality of PE. PE teachers should cooperate with class teachers tightly to help them integrate physical activity into other domains teaching. Class teachers should appreciate the benefit of physical activities, be clear about the objectives of PE curriculum, try to assist PE teachers' work, let the other physical activities in class become an extension of physical fitness class, and promote the whole development of all preschoolers. No matter what is the weather like, class teachers should promise at least one hour for children to do physical activities every day.

It is expected that after taking the SNU Kindergarten PE curriculum, all preschoolers in K3 will develop physical literacy that commensurates with their ages. The goal of PE is to foster preschoolers' physical literacy. That is to say, the goal of PE is to develop physically literate individuals who have the skills, knowledge, and confidence to enjoy a lifetime of healthy physical activity.

This statement was developed by physical education curriculum committee which was composed of the following members:

Ms. Lu (the headmaster), Ms. Cai (vice headmaster)

Mr. He (PE teacher), Mr. Liu (PE teacher),

Ms. Li (class teacher), Ms. Gong (class teacher),

Ms. Gong (parent). Ms. Peng (curriculum specialist in university), Ms.Duan

4.2.1.2 Defining the program goals

Program goals are broad statements of what the preschoolers will be able to do when they complete the program. Program goals should be anchored to Chinese educational policies about preschoolers healthy and physical education. There are no national standards for kindergarten PE. Kindergarten teachers have their idea about the goals of PE. In order to define the program goals and find the rationale supports, committee members, especially the PE teachers tried to check different resources to define the goal of PE. In the whole process of constructing the PE curriculum, a consensus-building technique was used to establish agreement on a variety of different types of issues when there were competing views (Kelly, 2004). According to the consensus-building technique, the committee members agreed with the general idea that the goal of PE in the kindergarten was to foster preschoolers' PL. Here were the rationales for taking physical literacy as the goal of PE.

It is necessary to take physical literacy as the goal of PE in kindergarten.

The goal of PE is the core of the PE curriculum system. It is a prediction of preschoolers' learning outcome during a particular time. In constructing a systematic PE curriculum, the goal is the core. It is the basis of choosing the curriculum content, determining curriculum organization, and teaching strategies, and it is also the criterion of curriculum assessment (Yu, 2014). If the goal is not clear, it cannot be understood comprehensively to direct teachers' practice sufficiently.

The current PE goal in kindergarten is not clear. The goal of PE in the kindergarten is described generally and abstractly in common. Such as: cultivating children's interest in physical activity, developing children's movement potential; promoting children's health (Du, 2010). The traits of the current PE goal are as following: (1) Most of the goals focus on what should be done, rather than how should be done. (2) Most of the goals emphasize on physical competence, ignoring preschoolers' cognitive, and affective. (3) Most of the goals keep an eye on preschoolers as common, neglecting them as individuals. (4) Most of the goals pay much attention to current development,

less on the foundation for the lifelong. In facing the current situation in the kindergarten, the goal of PE should be described clearly in an achievable way.

It is appropriate to take physical literacy as the goal of PE in kindergarten.

From Tyler's view (Tyler, 1949), the goal of the curriculum should come from three aspects: studies of children, studies of the society, studies of subject knowledge. From the study of children, childhood is a movement stage of life. This stage is the most crucial stage than any others of life that children are eager for movement, especially from two to six years. It is a crucial time for preschoolers to get mature FMS, active attitude, and knowledge of physical activities, then they can take an active part in physical activities in the future. It is an active start of PL journey for children in kindergarten. From the study of society, in today's highly automation, information society, preschoolers' movement space become smaller, their movement demands are neglected gradually, their movement motivation is growing shortage. Sedentary also becomes a lifestyle of preschoolers; their physical fitness is declining continuously; the obesity rate is getting higher in preschool years. Educators should reflect on what to do to encourage preschoolers to take an active part in physical activity in modern society. From the study of the subject, Whitehead and other researchers have systematically developed PL to be the goal of PE. Many countries have taken PL as the goal of PE and done a lot to foster children's PL in practice.

As Tyler's view (Tyler, 1949), the goal of the curriculum should be filtrated by educational philosophy and educational psychology. From the aspect of educational philosophy, the kindergarten curriculum goal is to achieve the sustainable development of children, so that the subjectivity of preschoolers rising for their life to shape the development of good quality. Therefore, the value of lifelong development of children should be taken to choose curriculum goals (Yu, 2014). Preschoolers' PL development lays the foundation for the individual to take an active part in physical activities for lifelong. From the aspect of educational psychology, Kindergarten curriculum goals should be consistent with the development of children's physical, mental and learning features, should be achieved by children through suitable learning activities, and should be attained at the right time (Yu, 2014). A wide range of physically challenging

situations and plenty of opportunities are offered for preschoolers to learn by ‘doing’ in fostering preschoolers’ PL. It is an active learning process for preschoolers to achieve the goals.

It is feasible to take physical literacy as the goal of PE in kindergarten

As it was emphasized that the definition of physical literacy was simple as well as sophisticated. It was simple because it clearly articulated what could be achieved, while it was a sophisticated process to translate the simple definition into meaningful components that enable teachers to guide their practice and implement key messages (Almond & Whitehead, 2012). It is crucial to know what are the building blocks to enable children to become physically literate? How is physical literacy nurtured?

Almond (2013) had worked to develop a pedagogy for translating physical literacy into practical steps. He put forward eleven principles which formed the aim of PE curriculum and the basis of the educational validity of PE and three pedagogy skills: building productive working relationships, creating the idea of ‘voice’ , creating a supportive environment to improve teachers practice. All these things can help teachers to understand physical literacy clearly then develop and deliver an authentic curriculum in their teaching.

Almond & Whitehead (2012) had translated broad recommendations concerning pedagogy into specific elements for teachers to respond to foster PL. They put forward six aspects of experiences to ensure children to have different kinds of experiences to be physically literate. They also put forward practical suggestions for teachers to help children make progress in their learning successfully. It is helpful for teachers to use in their PE practice.

From the above points of view, physical literacy is suitable and feasible to be the goal of PE in kindergarten. However, as a starting stage of physical literacy, the goal should be defined more specifically for preschoolers’ age to achieve. In defining PL as the goal of PE, the three parts (the affective, the physical, the cognitive) emphasized by Whitehead should be described clearly. The supporting rationales will follow the program goals.

Program goals and supporting rationales:

Goal statements: All preschoolers will acquire FMS which commensurate with their physical potential, which are the building blocks of all kinds of physical activities and underpin successful participation in sports games.

Rationale statements:

FMS are the basis of all sports skills in the future.

FMS are the decisive factor of preschoolers' physical literacy.

FMS are in developing progress and most FMS reach the mature stage at age 6.

Goal statements: All preschooler will acquire confidence in the learning process and be willing to take an active part in physical activities.

Rationale statements:

Preschoolers' confidence comes from accomplishing different tasks.

Preschoolers' confidence originates from awareness of their progress.

Preschoolers' confidence derives from knowing what they are capable of doing.

Goal statements: All preschoolers will acquire knowledge of movement and understand the value and rules of physical activities.

Rationale statements:

Learning knowledge of movement can improve the efficiency of motor skills learning.

Understanding the value of physical activities can motivate children's sports.

Understanding the rules of physical activities can offer children strategies to participate in physical activities joyfully.

Three kinds of goals were listed according to Whitehead's PL concept and the environment of the kindergarten in Table 4.8. It contained the goals of PE and delineated the objectives for each goal for K1, K2, K3. PE teachers could choose appropriate goals to form a plan for K1, K2, K3 respectively. Every kindergarten has different conditions, the objectives and content may vary according to the actual situation of the kindergarten.

Table 4.8 Goals and objectives scope and sequence for K1, K2, K3.

Goals	Objectives		K1	K2	K3			
Physical competence	F M S	Locomotor skills	Walk	--	**			
			Run	--	*	**		
			Jump from a height	--	*	**		
			Horizontal jump	--	*	**		
			Vertical jump	--	--	**		
			Run-up cross jump	--	--	*		
			Hop	--	*	**		
			Skip		--	**		
			Crawl	--	**			
			Climb	--	*	**		
			Slid		--	*		
		Gallop	--	--	**			
		Object control skills	Catch	--	*	**		
			Underhand throw	--	--	**		
			Overhand throw	--	*	**		
			Bounce a ball	--	*	**		
			Chest pass			--		
			Catch a ball		--	*		
			Dribble a ball	--	--	*		
		Kick a ball	--	--	--			
		Body management skills	Static balance	--	*	**		
			Dynamic balance	--	*	**		
			Straight body roll	--	--	**		
			Forward roll		--	**		
			Dodgy		--	*		
			Rope jump			--		
			Physical fitness	Speed		--	--	
				Strength	Leg strength	--	--	--
					Arm strength		--	--

		Abdominal Strength	--	--	--
		Endurance	--	--	--
		Agility	--	--	--
		Flexibility		--	--
Affective	Motivation	Be willing to take part in physical activity	--	--	**
	Confidence	Be confident to his/her ability	--	--	*
	Joy	Be happy in physical activity	--	*	**
Cognitive	Knowledge and Understanding	Body awareness	--	*	**
		Spatial awareness	--	--	--
		Value of physical activity	--	--	--
	Rules in physical activities	Problem-solving	--	--	--
		Following instruction	--	*	**
		Safety rules	--	*	**
		Cooperation	--	--	*
		Fair play	--	--	--
		Winning and losing		--	--
		Respect equipment and property	--	--	**

-- indicates when instruction will begin

* indicates when the objective is in the basic stage.

** indicates when the objective is to be mastered.

Table 4.9 Goals and objectives of the PE curriculum for K3 (the first semester)

Goals area	Objectives for k3			Which week to implement
Physical competence	Fundamental Movement	Locomotor skills	Walk	2
			Run	7

development	Skills		Horizontal jump	14	
			Vertical jump *	15	
			Run-up cross jump	15	
			Hop *	2	
			Skip *	16	
			Crawl	10	
			Climb	4	
			Slid *	5	
			Gallop*	6	
		Object control skills	Overhand throw	3	
			Bounce a ball	8	
			Catch a ball	9	
			Dribble a ball	6	
		Body management	Balancing	Dynamic	16
				Static	
			Forward rolling	11,12	
			Dodgy	5	
			Rope jumping	17,18	
	Physical fitness	Speed *		7	
		Strength	Arm strength*	13	
			Leg strength*	7	
Abdominal strength*			10		
Endurance *		7 , 14			
Agility *		3			
Flexibility *		17,18			
Affective development	Motivation	Be willing to take part in physical activity *	All activities		
	Confidence			Be confident to his/her ability *	
	Joy			Be happy in physical activity *	
Cognitive development	Knowledge and understanding	Body awareness *	All activities		
		Spatial awareness *			
		Value of physical activity *			

	Rules	Problem-solving*	All activities
		Following instruction *	
		Safety rules *	
		Cooperation *	
		<i>Fair play *</i>	
		<i>Winning and losing *</i>	
		<i>Respect equipment and property*</i>	

*Items with * means that these items are integrated into FMS learning process.*

In constructing the PE curriculum for K3, all the goals and objectives need to be achieved in the first semester were listed as an example in Table4.9. The first goal was the physical competence development which contained FMS and physical fitness. All the objectives in this part were arranged in the schedule. PE teachers have a physical fitness class for preschoolers in K3 twice a week, 35minutes once. PE teachers count the time which could be used in this semester and assign different objectives to each week. They gave structured physical activities for children by following this time schedule. When they counted the time, they needed to prepare at least three weeks for holiday or other extra time. The physical fitness objectives could be combined in the warm-up of the physical activities when they are compatible with them. The second one was the affective part which main contained motivation, confidence, and joy. The last one was the cognitive part which contained knowledge and understanding of physical activity and the rules. All of the objectives in these two parts will be integrated into children’s FMS learning process. When PE teachers design their activities, they should consider three kinds of goals comprehensively.

4.2.1.3 Delineating objectives for each goal

In describing the objectives in Table 4.9, FMS in the physical competence part was described concretely, because most of these objectives were measurable. The affective and cognitive parts were described generally, teachers integrated them into the teaching process, and found more qualitative information to describe them in practice.

Table 4.10 Specific measurable objectives needed to achieve each of the program goals

Objectives	Description (FMS)
•Walk	•Can walk orderly one - on - one. •Can walk and change direction after listening to the signal.
•Run	•Can change direction and speed after listening to the signal.
•Horizontal jump	•Can grasp the skill of horizontal jump and jump for 100cm far.
•Vertical jump	•Can finish vertical jump and touch things 30cm away from the end of the finger.
•Run-up cross jump	•Can finish run-up cross jump and can cross parallel lines which is no less than 60cm
•Hop	•Can hop 10 times with the same foot and hop 8m steadily
•Skip	•Can skip rhythmically
•Crawl	•Can crawl smoothly with belly on the floor
•Climb	•Can climb 5 wall bars with two feet on different bars
•Slid	•Can perform a basic slid
•Gallop	•Can perform inefficient gallop
•Overhand throw	•Can perform a nearly mature overhand throw, and throw a beanbag 5m away
•Bounce a ball	•Can continuously bounce a ball more than 5 times
•Catch a ball	•Can catch a ball thrown to them with hands
•Dribble a ball	•Can dribble a ball without lose it
•Static balance	•Can balance on one foot for 5 seconds
•Dynamic balance	•Can walk on the beam (width: 10cm, height: 30cm) fluently, alternating feet.
•Forward roll	•Can perform a basic forward roll
•Dodge	•Can avoid the ball that others roll over agilely
•Rope jump	•Familiar with rope and can have a try
Description (affective)	
•Motivation	•Be willing to take part in physical activities
•Confidence	•Be confident in his/her ability in participating in physical activities
•Joy	•Be happy in physical activities
Description (cognitive)	
•Body awareness	•Know the names of the body parts.

	<ul style="list-style-type: none"> •Know what the body parts can do. •Know how to make the body parts more efficiently.
•Spatial awareness	<ul style="list-style-type: none"> •Know how much space the body occupies. •Know the body’s relationship to external objects.
•Value of physical activity	<ul style="list-style-type: none"> •Know the benefit of physical activity.
•Problem-solving	<ul style="list-style-type: none"> •Know the strategies to solve problems in taking physical activities
•Following instruction	<ul style="list-style-type: none"> •Understand the meaning of teachers’ instruction and can follow it.
•Safety rules	<ul style="list-style-type: none"> •Know the rules to keep safe.
•Cooperation	<ul style="list-style-type: none"> •Know how to work with others to finish the task.
•Fair play	<ul style="list-style-type: none"> •Know rule is important in the play.
•Winning and losing	<ul style="list-style-type: none"> •Know what is winning and losing. Know losing is ok.
•Respect equipment and property	<ul style="list-style-type: none"> •Know everyone should protect all the equipment.

After the final objectives for each goal have been determined in Table 4.10, each of the FMS objective was operationally defined in detail in terms of both process and product measures to give quality and quantity changes that occurred in preschoolers’ motor development progress. Teachers could assess preschoolers’ horizontal jump performance by measuring how far they could jump. It was the product measure because it focused on the outcome of the horizontal jumping performance. Product measures were used often, because they were more objective and easier to measure accurately and reliably. Process measures, on the other hand, measured how a skill was performed. These measures were more concerned with measuring what happened during the process of the performance of a skill. Teachers must know the critical components of the skill they were assessing and practice how to observe and judge these components as preschoolers’ performing them in process measures. Teachers also need to know why these components were essential or what was the value of the components in performing the skill.

Mainly 20 motor skills involved in K3 were described from process and product clearly, and the observation instruments for corresponding motor skills were created (See Appendix H). Here is an example:

Horizontal jump:

Given a verbal request and a demonstration, preschoolers will try to jump at least 100-110cm far. On one out of two trials, while trying to demonstrate the following performance standards:

1. **Eyes** focus forwards
2. Bend both **knees** slightly
3. Swing both **arms** from front to back
4. Two **feet** push against the ground firmly and take off together
5. Jump forward with **legs** straightened
6. Balance landing with both **feet** on the ground together

An observation instrument for teachers to evaluate preschooler's horizontal jump development was created in Table4.11. The process part shows the essential components of performing a mature horizontal jump. The product part shows the target distance of horizontal jump which was decided according to relevant policies or documents in China. The target distance only shows a rough number of which PE teachers think 70% of preschoolers can achieve at this age. The observation instrument offers teachers concise information about what to be observed when preschoolers perform a horizontal jump. Teachers record whether the preschooler has demonstrated each performance criterion. They can collect information about which components preschoolers usually demonstrate in performing horizontal jump at this age in their kindergarten. They can also collect information about how far preschoolers can normally jump in their kindergarten and decide if they achieve the target. This kind of observation instrument gives more detail information for teachers to understand preschoolers' motor skill development. Teachers may know the results of preschoolers' performance and also know why they can achieve it and how they can do better. It also an instrument for teachers to assess preschoolers' development in the assessing stage.

Table 4.11 The observation instrument for horizontal jumping

Names	Process						Product (cm)	
	Eyes focus forward	Knees bend	Arms swing	Feet push firmly, take off together	Legs straighten	Feet land on together	Target: Girl: 100cm Boy : 110cm	
							Pre-	Post-

4.2.1.4 Sequencing of the curriculum content

The time for PE teachers to instruct K3 was limited in twice a week and 35 minutes each time. Exclude three weeks of flexible time; PE teachers have nearly 17 weeks to take physical fitness class for preschoolers in K3. According to the time available, PE teachers chose the content of the PE curriculum based on their movement experiences in teaching. Table 4.9 shows all the content of the first semester in K3. The content contained preschoolers' physical, affective, and cognitive development. All the content was distributed to each week in the light of the features of the skill, the weather of the city, the application of the equipment, and the age of the children. The sequencing of the curriculum content for the first semester was listed in Table 4.8.

4.2.2 Assessing

Assessing is the process of collecting information to make an informed decision which needs to be made to determine what to assess, the type of assessment instrument. Meanwhile, assessment is also a means of communicating to students where they are on the content being taught and what they need to learn next (Kelly, 2004). The ABC model uses a curriculum-embedded assessment process to make decisions. The curriculum-embedded assessment item has two parts: the objective definition created via the process of task analysis and a score sheet that listed the key components and provided space to record preschoolers' performance (Kelly, 2004). Task analysis was the breaking down of a motor skill into its parts like what has been done in Table 4.10. Here a motor skill (overhand throw) was broken down into its components and then

the components were used as assessment criteria. The overhand throw assessment instrument is in Table 4.12.

Performance objectives: Overhand throw

Given a verbal request and a demonstration, preschoolers will throw the tennis to a target 5-7m away. On one out of two trials, while trying to demonstrate the following performance standards:

1. **Eyes** focused on the target.
2. Step towards the target with the **foot** opposite throwing arm during the throw
3. Throwing **arm** nearly straightened near the shoulder
4. **Hip** and **spine** rotation in preparation for and during the throwing action
5. Throwing **arm** follows through down and across the body.

During the assessing process, teachers should pay attention to preschoolers' responds which can be grouped into the ACE factors: attention, comprehension, and effort (Kelly, 2004). According to the above components, a performance score sheet for overhand throwing was created in Table 4.12.

Table 4.12 Performance score sheet for overhand throwing

Time: _____ teacher: _____ class: _____

Names	Process						Product (m)			
	Eyes focused target	step forward with the foot opposite throwing arm	Throwing arm straightened	Hip and spine rotation	Throwing arm follows down	Pre-/post-			Target: Girl: 5m Boy: 7m	
A						C	E	Pre-		Post-
						/	/	/		

ACE rating: a= above average, b= average, c= below average, (pre/post)

Assessment: Achievement = x, Not achievement = O

Reassessment: Achievement = Ø, Not achievement = Ø

Assessing is the key to effective instruction and essential for students' learning to occur (Kelly, 2004). After the appropriate curriculum-embedded instruments were made, they can be used in different situations for different purposes in the kindergarten.

PE teachers can use it at the beginning part of the activity for planning appropriate lessons. They give chances for preschoolers to show their skills and observe children's performance; then they know where most preschoolers are on the skill target for instruction. In the teaching process, PE teachers can inform preschoolers of the key components of the skill and told them which of the components they have mastered and which they need to work. Preschoolers can use it to evaluate themselves and give feedback to their partners.

When PE teachers are instructing preschoolers in a physical fitness class, class teachers can observe and record preschoolers' performance, collecting information for organizing physical games to improve preschoolers' motor skill development later. It is very useful for class teachers to know the objectives and the components of motor skills. Of course, they need to practice before they use an instrument for the first time. The PE teachers should give some training for class teachers to be familiar with each motor skill.

During the assessing process, teachers should pay attention to preschoolers' responds (ACE). Teachers must be sure that preschoolers have attended to the instructions and be sure that preschoolers understand the instructions and encourage them to try their best to do it.

Pre-assessment data and post-assessment data provide a basis for ongoing evaluation of the effectiveness of instruction. All the information can be used to guide instructional planning and as the basis for preschooler evaluation and program evaluation.

4.2.3 Implementation planning

The ultimate success of a physical education program is reflected not only in what teachers do but also in what the preschoolers do in response. Teachers should determine the purpose, organize the sitting, facilitate preschoolers' engagement, collect achievement data, and make program adjustments. Preschoolers produce their

learning through attention, comprehension, and effort. They work together to achieve maximizing learn and effective teaching.

4.2.3.1 Maximizing learning and effective teaching

In the implementation planning process, teachers should make clear what influenced preschoolers learning and how to organize instruction for maximum learning. From the perspective of dynamical systems theory, an increasing number of researches focused on a dynamical explanation of children's movement development that individual, environment, and task interacted with each other in the development process (Newell,1984, Gallahue,1997).

The individual factor includes the body structure (shape, organs, muscles, etc.), and functional (mechanics of body). The environment factor includes the physical environment (the movement space, the ground, the light condition), and social environment (experience, learning environment, sports culture). Three factors were not only influenced by one another but also might be modified by one another (Gallahue,1997). The extent to which one can understand preschoolers' individual, environment, and task factors determined the extent to which one can respect their individuality.

Teachers must create a positive learning environment for maximizing learning and effective teaching based on preschoolers' individuality. Danielson (1996) put forward the components of a positive learning environment(as cited in Kelly, 2004, p. 179-187).

(1) Creating an atmosphere of respect and rapport which are characterized by friendliness, openness, and humor. All preschoolers will feel valued and safe and will be treated with dignity by teachers and partners (Kelly,2004).

(2) Establishing a culture for learning which means that teachers and preschoolers engage in activities and tasks that are highly valued and expected for high-quality work. Preschoolers and teachers are proud of their work and are full of energy.

(3) Developing management procedures which can promise the smooth operation of the environment and the efficient use of time. Classroom management is everything that a teacher does to organize student, space, time, material, equipment, and facilities to maximize student learning(Kelly,2004).

(4) Managing student behavior which means to set up an agreement on standard of conduct and explicit consequences of student behavior. Teachers should offer positive methods to increase appropriate behavior and decrease inappropriate behavior.

(5) Organization of physical space which reveals to students how teachers view learning. Students feel safe and have access to learning resources.

Implementing the curriculum involves not only making pre-instructional decisions for maximizing student learning but also the explicit decision associated with effective teaching. There are five principles of effective teaching associated with student learning and achievement (Kelly, 2004, p. 187-193).

(1) Communicating clearly and accurately. Teachers should give preschoolers clear and precise instructions and let them understand their role and teachers' expectation.

(2) Executing instruction skillfully. Effective presentation and demonstration are significant in instruction. Teachers should attract most of the preschoolers' attention and make sure all of them can see the demonstration, can understand it. While giving instruction, teachers should also focus on observing preschoolers' response and analyzing preschoolers' achievement.

(3) Motivating students to achieve. Effective teachers set reasonable high expectations, achieve high success rates, have positive behavioral interaction, assign developmentally appropriate learning tasks, and use sensible reward structures.

(4) Engaging student for achievement. Teachers can effectively present the content, design the learning tasks in flexible structure, create a problem-based learning environment to increase the challenge, group students in a different size.

(5) Providing feedback to students. It is valid to give students accurate, specific, and constructive feedback immediately in the learning process.

All the components and principles associated with maximizing learning and effective teaching mentioned above can be integrated into a mastery motivational climate in relation to TARGET class structure.

Teachers should try to create a mastery motivational climate in the kindergarten to achieve maximizing learning and effective teaching. Boyce suggested some strategies to enhance a mastery motivational climate (Boyce, 2009, p. 52) in Table 4.13.

Table 4.13 Strategies that enhance a mastery motivational climate

Structure	Strategies	Examples of strategies
•Task	•Multiple tasks	<ul style="list-style-type: none"> • Use a practice style or stations format to cover tasks Provide choice activities
	•Task extensions	<ul style="list-style-type: none"> • Use wheel for task extensions(Graham et al.,2007) Rink’s(1998) ways to increase task difficulty
	•Novel tasks	<ul style="list-style-type: none"> • Teach adventure activities, juggling, Pilates rollerblading
	•Student interest	<ul style="list-style-type: none"> • Select interesting tasks
	•Goal of task	<ul style="list-style-type: none"> • Use the KISS (keep it simple, stupid) principle to explain tasks • Focus on self-improvement and individual effort • Select tasks that are meaning and relevance to students • Select developmentally appropriate tasks •Select tasks that are accomplishable but that require effort and practice to achieve • Help students to establish short-and long-term goals related to tasks • All students participate in all tasks
•Authority	•Shared decision making	<ul style="list-style-type: none"> • Use less direct teaching style or approach(student design, inclusion, check, peer, cooperative) • Use the sports education model • Provide opportunities for student choice(e.g., students participate in establishing class rules) • Give opportunities to help students develop responsible decision making • Help students develop the ability to self-manage their own activities

	<ul style="list-style-type: none"> •Student leaders/ roles 	<ul style="list-style-type: none"> • Use less direct teaching style or approach(student design, inclusion, check, peer, cooperative) • Use the sports education model • Students chose to showcase their skills • Encourage students to evaluate themselves
•Recognition	<ul style="list-style-type: none"> •Individualized feedback •Mastery feedback •Private feedback 	<ul style="list-style-type: none"> • Tailor feedback to each student • Address the student’s performance only, not the performance of others • Focus on effort and improvement • Give feedback that improves the next skill attempt • Talk to students on an individual basis • Make sure all students receive feedback • Recognize everyone’s role in class contributions
•Grouping		<ul style="list-style-type: none"> • Use small-sided games • Eliminated waiting in line • Everyone should have their own equipment (when feasible) • Vary grouping across tasks (different groups per task) • Groups should work toward a common goal • Students should not be pitted against one another
•Evaluation	<ul style="list-style-type: none"> •Improvement-based •Private •Formative •Open process 	<ul style="list-style-type: none"> • Address the student’s performance as compared to self • Emphasize the “personal best” • Talk to students on an individual basis • Conducting ongoing evaluations so that students can gauge their own progress • Provide many opportunities to show improvement • Inform students of the grading process • Give students choices related to the ways they might be evaluated (e.g., the student can determine the percentage of grade for different tasks or

activities; students could select a grading procedure, such as authentic assessment product, a skill test, portfolio exhibits, self-assessment, etc.)

	<ul style="list-style-type: none"> • Student effort • Mistakes 	<ul style="list-style-type: none"> • Use exit slips (Graham et al., 2007) • Recognize student effort • View mistakes as part of a learning process
<ul style="list-style-type: none"> • Time 	<ul style="list-style-type: none"> • Flexible time allotments 	<ul style="list-style-type: none"> • Give early achievers other skills to work on while allowing other students the time they need to achieve the primary task • Use practice-teaching style (Mosston & Ashworth, 2001) so students can decide how long to work on tasks and when it is time to change tasks • Let students work at their own pace

Here are the specific features of mastery motivational climate in kindergarten PE in China.

Task

Within the mastery motivational climate, teachers choose the objectives of the activity and design 4-5 tasks that are related to the objectives. Teachers provide preschoolers with multiple tasks from which to choose the tasks that match their ability and are moderately challenging to them. Teachers explain the goal of the activity and demonstrate the motor skill involved in the activity. Then they lay out equipment and set up a variety of tasks. These tasks are designed to meet the different ability levels of all preschoolers so that they may experience regular success after practice. The process of accomplishing of the tasks is a process for them to achieve their development goals. Teachers emphasize problem-solving and facilitate creative and unique ways of accomplishing tasks. Teachers provide preschoolers the freedom to choose the challenge levels of the tasks and increase the opportunities for success and motivation to engage in more challenging tasks.

Authority

The mastery motivational climate emphasizes autonomy and independence. Teachers design varied levels of tasks and encourage preschoolers to be self-directed and in charge of their own engagement in physical activity and skill mastery. Teachers give preschoolers chances to create the level of the tasks and the rules for appropriate and safe behavior. In the mastery motivational climate, preschoolers have the freedom to choose the level of tasks which they want to engage in and challenge themselves. Preschoolers dictate to their tasks, and teachers guide them through effortful engagement, learning, decision-making, and problem-solving processes.

Recognition

In the mastery motivational climate, teachers pay attention to recognition for preschoolers' performance. Teachers recognize participants on an activity basis for their effort, accomplishments, or progress. They give preschoolers recognition individually. They try to give feedback equitably to all preschoolers. When teachers give feedback, they prefer to focus on the knowledge of performance (the process), not to the knowledge of results. They give preschoolers specific feedback about the essential movement elements constructively and timely.

Grouping

In the mastery motivational climate, teachers try to offer more equipment to organize small groups. Then preschoolers do not need much time to wait in line. They can adjust their groups flexibly and freely.

Evaluation

In the mastery motivational climate, teachers evaluate preschoolers' engagement in physical activity, their effort, and their achievement based on a self-referenced criterion for success (i.e., previous performance). Teachers also offered preschoolers the opportunity to evaluate themselves according to their achievement of the tasks. Evaluation is individualized for each preschooler.

Time

In the mastery motivational climate, teachers allow optimal time for physical activity engagement and skill mastery to occur. Preschoolers are afforded enough time to investigate a task fully and to make mastery attempts at that given task. Teachers

encourage preschooler to explore a task on their terms, so that each preschooler had an optimal amount of time to practice and exert effort to accomplish the task. Teachers advise earlier achievers to design and achieve the new task. Teachers give verbal cues to help preschoolers manage their time in different tasks.

In the ABC model, a mastery-oriented climate can be created by teachers. The goal of a mastery-climate is to create a motivating learning environment where effort is encouraged, and the learning process is reinforced (Ames,1992b). Ames (1992a,1992b) developed six dimensions of the classroom structure, known as TARGET to create a mastery-oriented climate which could be implemented in physical education settings (Valentini et al.,1999). The mastery-oriented climate is appropriate for preschoolers' physical literacy learning. Morgan (2013) argued that the pedagogical principles identified by creating a mastery motivation seemed to be entirely consistent with the holistic concept of physical literacy and high-quality PE. In the mastery motivational climate approach, both teachers and preschoolers shared responsibilities for making choices, giving directions, monitoring task, enforcing rules, offering feedback, and evaluating success (Ames, 1992; Valentini et al., 1999; Valentini & Rudisill, 2004).

4.2.3.2 Planning for learning and teaching

In the ABC model, implementation planning involves two processes: developing teachers' templates and preschoolers learning formats (Kelly,2004). Teacher's templates define what a teacher does during instruction, and preschoolers' learning formats define how the preschoolers engage with the content to be learned. The teaching template can be created by addressing the following five fundamental questions (Kelly, 2004):

(1) What is the standard managerial procedure? Effective teachers have established rules, signals, routines, and procedures to manage the movement of individuals and groups.

(2) What is the format of the lessons? Usually, a simple format of PE class has three sections: warming up, body, relaxing in kindergarten.

(3) What content needs to be taught? Teachers will review the objectives and content of the curriculum (see Table 4.8) to decide the content.

(4) How will the content be presented and worked ? After teachers decide the specific instructional focus for a giving objective, they will choose appropriate instructional cues, teaching methods, learning experiences.

(5) How will the environment be organized for instruction? Teachers list the way to organize the class and enough equipment needed.

Here is an example of the PE teacher’s teaching template in the kindergarten in Table4.14.

Teacher: Mr. He Class: K3, 1 Time: 19.11.2018

Standard managerial procedure: Preschoolers wear sportswear and go to the designated place to gather after going to the toilet.

Table 4.14 Teaching template of kindergarten PE teachers

Format	Warming up	body	Relaxing
Objectives (minutes)	Run; skip; hop Vertical Jump; (5)	Bounce a ball (5) Horizontal Jump (20)	Relax Review
Instructional focus	Listen and action	Bounce a ball continuously ; Jump across different obstacles	Relax body parts Review the vertical Jump
Cue	Reverse run; Hop ; Skip; Jump high	Bounce a ball 5 times; Jump over	Lay down Pat on How many tasks
Learning experience	Teacher directed, teacher, explain four types of FMS to be acted, preschoolers listen to the whistle , and the number show the skill.	Teachers introduce each task, preschoolers choose one task freely, after accomplishing the task twice successfully, choose the next one. Teachers observe preschoolers and	Preschoolers show the vertical jump,and teachers observe their moment. Then preschoolers lay down on the mats and relax their body parts.

		provide instructional feedback.	
Organization	Scattered around the equipment	Teachers offered 5 tasks 1. jump over the circle 2. jump over the chair in the circle 3. jump over the mats 4. jump over the chair on the mats 5. jump over the chair and the mats	Preschoolers gather together to show their vertical jump, report their tasks. They lay on the mats and pat on the arms and legs with each other.
Equipment	A whistle	Five basketballs, Ten circles (40cm) 15 mats (60 cm wide) 15 chairs (23cm high)	15 mats (60 cm)

Reflections: In warming up, it should be no more than four skills. The distance between the mats should be more extensive for children to jump fluidly. Encourage preschoolers to work in pairs to accomplish each task. Teachers give a demonstration to the one who cannot jump over in the task and encourage them to try again.

The learning formats let teachers view their instructions from the perspective of children. The goal of this process is to ensure that all preschoolers know what they are doing during instruction. It is a process that teachers make sure their instruction matches the needs of preschoolers. Though most teachers do not write down the learning formats usually, the learning formats address six questions from the perspective of children (Kelly, 2004, p. 230) should be considered when they are working on the teaching template.

(1) Where should preschoolers be? Teachers should tell preschoolers where they should stay.

(2) Whom should preschoolers be working with? Teachers should think about how to group preschoolers in appropriate numbers for active engagement.

(3) What are the preschoolers' responsibilities during instruction? Teachers should let preschoolers know all skills have components, and they can master the skill by practice correctly in the game.

(4) How do they know if they are successful? Teachers should design tasks that provide preschoolers appropriate assessment and feedback information.

(5) What are the teacher's expectations for preschoolers? Teachers should set a realistic target expectation from the process and the product for preschoolers to evaluate their progress.

(6) What should preschoolers do if they cannot meet teachers' expectation or when do they meet it? Teachers should create a positive and secure atmosphere in which preschoolers feel comfortable to ask for assistance.

When teachers design their teaching templates, it is suitable for them to answer all the above questions. Teachers should talk to themselves to make sure they are thinking from the perspective of children. It is a process for a teacher to reflect his/her plans by asking himself about children's learning constantly.

The implement planning process is a sophisticated process. Teachers should assess preschoolers' development, know the specific goals of teaching, choose the appropriate content, create a mastery motivational climate, offer effective learning experiences for preschoolers to learn.

4.2.4 Evaluation

Evaluation is an essential means to promote the development of every preschooler and improve the quality of education. The process of evaluation is an important way for teachers' self-development (Teaching Guideline for Preschool Education, 2001). The core of kindergarten evaluation is development. The purpose of the developmental evaluation is on one side, to promote the development of every preschooler, the reflective growth of teachers, and the improvement of education quality, on the other side, to give feedback, adjustments, and improvements to the curriculum (Yu, 2014). Evaluation is the process of interpreting preschoolers' assessment data to decide preschoolers' achievement and program merit. Evaluation in the ABC model refers to both preschooler evaluation and program evaluation.

Preschooler evaluation

The key to preschooler evaluation is collecting ongoing assessment data on how preschoolers are performing on the instructional objectives (Kelly, 2004, p. 242). There are two types of preschooler evaluation: formative and summative.

Formative evaluation focuses on the process and interpreting why specific results occur. In the teaching practice, PE teachers give chances for preschoolers to explore the target movement skill first. They will observe preschoolers' performance to see how many components they have got and decide which components need to be reinforced. After instructing preschoolers, preschoolers begin to take different tasks to practice the skills. Teachers then observe and give instruction and individual feedback to preschoolers. PE teachers do not often record their assessments because of limited time. They often give general information about preschoolers' skill mastery to class teachers. They tell class teachers which components preschoolers need to practice and who need to do more practice in general.

In PE teacher's physical fitness class, class teachers can observe preschoolers' performance and record the information according to the performance score sheet (e.g., Table4.11). All the recording can offer information for PE teachers to reflect on their teaching process and design a new plan, meanwhile can offer information for class teachers to organize physical games to improve preschoolers' development. Typically, class teachers try to observe preschoolers who need to do more practice in later physical activities.

In assessing the affective and cognitive development, there is no specific instrument to assess preschoolers' development. Teachers often collect detailed descriptive information by observing preschoolers' performance (language, action, expression) and find proofs to interpret preschoolers' development in these domains. At the same time, the ACE factors in the score sheet (Table4.11) reflect preschoolers' affective and cognitive parts of PL to some extent.

A movement story is a way of recording observations and reflections (see Table4.15). A movement story gives a little background information about what is happening, where and why. Teachers record preschoolers' performance, then reflect

parts of the story that demonstrate a particular learning outcome. Teachers can offer vivid information to describe preschoolers' development and explain why. It is a good way for PE teachers to reflect on their teaching plan and preschoolers' learning process, to find implications for further plan.

Table 4.15 A movement story

<i>Movement story</i>	
<p><i>Preschooler name: <u>Jiang *</u></i> <i>Name of observer: <u>Mr. He</u></i> <i>Time: <u>19.11.2018</u></i></p>	<p><i>Reflections and implications</i></p>
<p><i>Background</i> <i>I review the key components of the horizontal jumping and design 5 tasks for preschoolers to play “passing through the game”.</i> <i>Preschoolers can choose any task to begin.</i></p>	<p><i>I design a short story that frogs are good at jumping. They are playing a “passing through the game”. The story can attract preschoolers’ attention to focus on the rules of game.</i></p>
<p><i>Story</i> <i>Jiang * is a boy of 5 years old. He chose to begin with task 3. He stood behind the mat and looked in the front. He bent both knees slightly while swinging both arms from front to back. He jumped over the mat successfully one by one. Then he ran to a basketball 10 meters away and bounced it 5times continuously and catch it. After that, he ran back and tried again in task3. Then he continued to accomplish all the tasks. After that, he said to himself: “Ha Ha, I have done all of them!” There was a smile on his face. Then he ran to me to asked: “Mr. He, I have finished all the tasks successfully, what’s the next?” I asked him to try to design a task for himself.</i></p>	<p><i>Jiang * can understand my instruction clearly and concentrate on his tasks industriously. He almost masters the key components of the vertical jump. He can reach the target of jumping 110cm far. He needs to improve the consistency of his jump like other preschoolers.</i></p> <p><i>The 5 tasks are different in levels offering preschoolers chances to challenge themselves. They can get confidence after they accomplish challengeable tasks. Jiang * showed his confidence on his face.</i></p> <p><i>To ran and bounce a ball is a small task to reduce the waiting time and also practice bouncing a ball.</i></p> <p><i>Preschoolers are different. When design the tasks we must consider all preschoolers’ need.</i></p>

	<i>Preschoolers learn to set reasonable objectives for themselves in practice.</i>
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The summative evaluation focuses more on the overall outcomes of instruction over time after the implementation of the curriculum. In this study, the general goal of PE in kindergarten is to foster preschoolers' PL. Though PL is a comprehensive concept, PE teachers can choose some instruments to test preschoolers' PL development from different perspectives. The National Standard Manual for Physical Fitness Measurement (General Administration of Sport, 2003) can be used to test preschoolers physical fitness. The MOBAK-KG (Herrmann et al., 2018) can be used to test preschoolers' basic motor competencies. Pictorial Scale of Perceived Competence and Social Acceptance (PSPCSA) (Harter & Pike, 1984) for preschool and kindergarten-age children can be used to test preschoolers' perceived physical competence. Summative evaluation can be done at the beginning and end of a semester or an academic year to collect preschoolers' pre- and post-performance data on the objectives. According to the formative and summative information about preschoolers' development, teachers can create a preschooler evaluation report to share with other teachers, headmasters, parents, and preschoolers.

Program evaluation

Program evaluation is a process of determining and communicating program merit and areas that need to be reviewed for potential revisions (Kelly, 2004). Program evaluation in the ABC model addresses three fundamental questions (Kelly, 2004, p. 267):

- (1) Is the program producing the desired results? This question is concerned with preschoolers' outcomes. Teachers use the data of preschooler' development to examine this question.
- (2) Is the program being implemented as intended? This question focuses on whether teachers are implementing the program as defined in the program plan. Teachers should systematically survey all the curriculum components and find information to tell how is the curriculum implemented.

(3) Is the program plan appropriate? This question is designed to reflect on what is done well and what needs to be done to make the plan better.

The goal of program evaluation is to identify effective practices that can be repeated and the ineffective practice that needs to be replaced or improved. It is necessary to write down the whole program and revised it according to the evaluation in practice. It is a long way to make the PE curriculum get better and better

4.3 The features of the new kindergarten PE curriculum

Now the author has described the old PE curriculum in the kindergarten and has shown the process of constructing the new PE curriculum. Kindergarten PE curriculum is kindergarten-based. To some extent, every kindergarten should have their unique PE curriculum, but there are some standard components to construct the kindergarten-based PE curriculum. The features of the new PE curriculum can be seen from the comparison of the old and the new PE curriculum in Table 4.16.

Table 4.16 The features of the old and new PE curriculum

Curriculum components	Old PE curriculum	New PE curriculum
•PE Curriculum philosophy	• Not clear	• Clearly described
•Goals of PE Curriculum	• Motor skills	• Physical competence: motor skills; physical fitness ; • Affective: motivation, confidence, joy; • Cognitive: knowledge and understanding, rules.
•Content of PE Curriculum	• List of motor skills and guiding points of physical activities	• Specific content in three domains allocated in every week
•Principles in implementation	• A performance climate	• A mastery motivational climate
•Evaluation strategies	•Observation recording; •Sports meeting;	• Formative evaluation Assessment in teaching:

(Observation instruments)
 Observation recording :
 (Movement story)
 Teachers' reflection
 Summative evaluation:
 Test for physical fitness,
 Basic motor competence, and
 Perceived physical competence

Table 4.16 listed the features of the old and new PE curriculum. The new PE curriculum was refined from the old PE. Comparing to the old PE curriculum, the new PE curriculum has its features.

4.3.1 The PE curriculum philosophy is clearly described

The PE curriculum philosophy shows the values of physical activities, the policies to guarantee enough amount of physical activities for preschoolers, the duties of the headmaster, PE teachers and class teachers to offer high-quality physical activities for preschoolers, and the general goal of PE. All the information mentioned in the PE curriculum philosophy offers the policy basis for fostering preschoolers' PL in kindergarten. Everyone in the kindergarten can know and should know the PE curriculum philosophy and try to create a learning environment for preschoolers to achieve the learning goals. There is no specific description of the PE curriculum philosophy in the old PE curriculum.

4.3.2 The goals of PE curriculum are clearly delineated in general and in specific

The general goal of PE in kindergarten is to foster preschoolers' PL. The specific goals of PE in the kindergarten are defined from preschoolers' physical competence, affective and cognitive as follow: All preschoolers will acquire FMS which commensurate with their physical potential; All preschooler will acquire confidence in the learning process. All preschoolers will acquire knowledge of movement and understand the value and rules of physical activities. The PE curriculum delineates the objectives for each goal. Each of the FMS objective is operationally defined in detail

in terms of both process and product measures to give quality and quantity changes that occur in preschoolers' motor development progress. Observation instruments for teachers to evaluate preschooler's FMS development are created. The affective and cognitive objectives are described in general, and teachers can offer more qualitative information to describe them in the teaching process. All the goals are allocated into the schedule. The description of goals and objectives in the new PE curriculum are more comprehensive, detailed, operable, and observable than in the old one.

4.3.3 The comprehensive content of PE curriculum is listed

The content of the kindergarten curriculum are the knowledge and activity system of direct and indirect experiences selected purposefully according to the educational goals of kindergarten (Wang, 2018). The content in the new PE curriculum contain knowledge and activities to attain the targeted objectives in physical competence, affective, and cognitive development (see Table4.10) and are allocated into the schedule. The content in the new PE curriculum are more comprehensive and specific than in the old one. All the activities should come from preschoolers' real life and meet diverse preschoolers' needs and interests.

4.3.4 A mastery motivational climate is advocated as the main principle in the implementation

Principles in implementation PE curriculum are the core element to guarantee the accomplishment of the goals. There are no definite principles in curriculum implementation in the old curriculum, but it shows a performance climate in teaching practice. In the new PE curriculum, a mastery motivational climate should be created to achieve maximizing learning and effective teaching in PE.

Preschoolers can develop their PL in the mastery motivational climate. In this kind of climate, preschoolers get more opportunity to interact with the environment to acquire confidence, motivation, physical competence, knowledge, and understanding of physical activities. That is, preschoolers get the valid learning experience, which is defined as the interaction between preschoolers and the external conditions that found in the environment (Kelly, 2004). Teachers' teaching and preschoolers' learning are

integrated into the curriculum implementation process. When teachers design their teaching plan, they decide what they will do in their instructions; at the same time, they anticipate how preschoolers will respond to their instructions. Teachers design diverse environment which matches preschoolers' interests, competencies, and needs. Preschoolers get more chances to practice all the skills at their own pace. They experience success constantly and reinforce their feeling of improvement through self-assessment and positive recognition from teachers and partners. They seek feedback on their own progress as a guide to further effort. They are active learners in the mastery motivational climate, while teachers are their leaders, co-operators, and supporters.

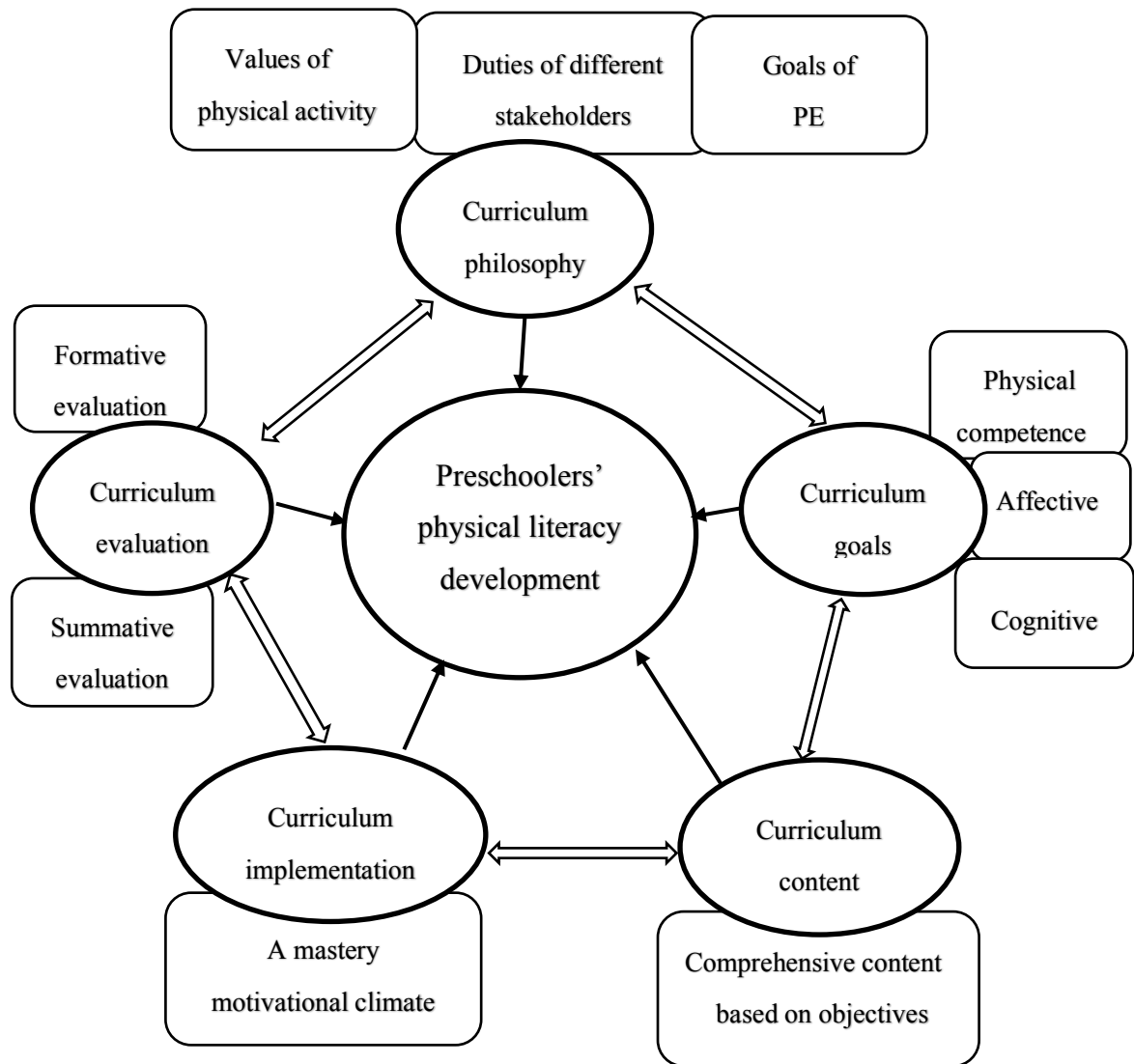
4.3.5 The combination of formative evaluation and summative evaluation is an effective curriculum evaluation strategy

Teachers try to use a variety of strategies to achieve effective evaluation. Formative evaluation is used to gather detailed information during curriculum implementation to show the process of preschoolers' development from different perspectives. Assessment in the teaching practice offers process and product data about preschoolers' FMS development. Preschoolers' movement stories vividly describe preschoolers' development individually. Teachers' reflection on their teaching, preschoolers' learning, and program development record their professional development journey. Teachers' reflection is a useful way to evaluate teacher' professional development. All the information offers the foundation for teachers to adjust their teaching plan effectively and timely.

Summative evaluation is used to collect quantitative data to show the result of preschoolers' development. Test after teaching offers product data about preschoolers' physical fitness, basic motor competence, perceived physical competence development. Qualitative data and quantitative data collected in the evaluation process offer enough information to evaluate preschoolers' development and program development effectively. In the old PE curriculum, teachers usually used observation and sports meeting to gather information to evaluate curriculum development randomly and ineffectively.

Generally speaking, the new PE curriculum is systematically constructed underpinned by fostering preschoolers' PL on the basis of the old one. It is visible and better. Figure 4.1 shows the key components of the new kindergarten PE curriculum in the kindergarten.

Figure 4.1 The structure of systematic physical education curriculum



The five components of the new PE curriculum all focus on preschoolers' PL development. They are written down clearly on paper during the constructing process. It is critical for the development of the PE curriculum to be written down. Many veteran PE teachers in the kindergarten only construct their PE curriculum "in their mind." They have rich theoretical knowledge and practical experience, but all are in their mind. The PE curriculum will leave with them after they retired. That is why many

kindergartens do not have their own PE curriculum years later. The new PE curriculum is written down to make it visible and will be constantly evaluated after the practice to make it better and better.

4.4 The effect of the new PE curriculum on preschoolers' development and teachers' development

In this study, after constructing the new PE curriculum for K3 in SNU Kindergarten, a quasi-experiment is conducted in the kindergarten to see how does the new PE curriculum work in improving preschoolers' development and teachers' development. Here are the procedures and results.

Procedures

A pre-test of preschoolers' physical fitness, basic motor competencies, and perceived physical competence was conducted in two groups at the beginning of the quasi-experiment in October 2018.

Then the PE teacher in the experimental group used the new PE curriculum to teach class1, and the PE teacher in the comparison group used the old PE curriculum to teach class3. Two PE teachers had physical fitness class twice a week lasting 35minutes for each group. They chose the same FMS to teach in the same week. There was no intervention in the comparison group, and the PE teacher used the traditional approach (a performance climate, see Table4.3 and the specific features of performance climate in kindergarten PE in China followed it) to teach.

In the experimental group, the PE teacher created a mastery motivational climate where preschoolers had the freedom to choose tasks and had some control over what they had learned and for how long in tasks. Preschoolers were involved in monitoring and evaluating their own performance (Ames, 1992). The model used the acronym TARGET as the focus areas for implementing the strategy. Table 4.17 gave a description of how the model was used during the intervention (see detailed description from p.114-116).

Table 4.17 The description of mastery motivational climate in relation to TARGET class structure in the kindergarten

Structure	Description
•Task	<ul style="list-style-type: none"> • Five tasks are set-up by the PE teachers • Tasks ranged from easy to hard • Teachers prompt preschoolers to performance tasks appropriately <p>Preschoolers choose the order of the tasks to participate in</p>
•Authority	<ul style="list-style-type: none"> • Preschoolers decided what tasks they want to perform • Teachers discuss with preschoolers about creating rules and using the equipment
•Recognition	<ul style="list-style-type: none"> • Teachers provide preschoolers with feedback as they performed privately and individually • Teachers give specific feedback to preschoolers on their performance <p>Teachers give corrective feedback to preschoolers on what to do and what not to do in future performance</p>
•Group	<ul style="list-style-type: none"> • Teachers try to organize tasks in small groups • Preschoolers choose to join in different groups
•Evaluation	<ul style="list-style-type: none"> •Teachers evaluate preschoolers’ effort and progress to motivate hard working • Teacher evaluate preschoolers’ performance on their past performance • Teachers talk to preschoolers about their achievement privately
•Time	<ul style="list-style-type: none"> • Teachers give preschoolers free time to spend on mastering each skill •The earlier achievers can have a chance to design and achieve the new task.

The PE teacher designed the teaching template (e.g., see Table4.14) clearly before the physical fitness class to make sure the creation of the mastery motivational climate in teaching. In the teaching process, the PE teacher used the evaluation instruments (e.g., see Table4.11) which were created in this study to assess preschoolers’

development levels and adjusted his teaching flexibly. The teaching process was observed, recorded, and discussed to keep the PE teacher on the way of delivering a mastery motivational climate, to ensure the PE teacher actively reflect on his teaching and preschoolers' response in and after the class.

A post-test of preschoolers' physical fitness, basic motor competencies, and perceived physical competence were conducted in two groups at the end of the quasi-experiment in January 2019.

The results

4.4.1 Preschoolers' Physical literacy development in two groups

Though there are 37 and 38 children in two groups respectively, only 32 and 33 children took all the test. More specifically, there were 16 boys and 16 girls in the experimental group, 17 boy and 16 girls in the comparison group. In pre-test and post-test, all data valued and no value was missing.

4.4.1.1 The comparison of preschoolers' physical fitness scores between pre-test and post-test in two groups

All data satisfied normal distribution by means of Q-Q plots. According to the Independent-Samples T-test, some degree of significant difference in some dimensions were presented in Table4.18.

In the pre-test, the average scores of the experimental group and comparison group were basically the same in all dimensions except for the Weight dimension. The experimental group was slightly higher than that of the comparison group, but there was no significant difference in 7 of the dimensions and Total score. The comparison group was higher than the experimental group in Weight dimension, and there was a significant difference in Weight ($t=-2.048^*$, $p=.046<0.05$).

In the post-test, the average scores of the experimental group in all dimensions except for the Weight dimension were higher than that of the comparison group. The average scores of experimental group were significantly higher than that of comparison group in some dimensions, showing significant difference in dimensions of Horizontal

Jumping ($t=3.393^*$, $p=0.001<0.05$), Throwing ($t= .136^*$, $p=.040<0.05$), Continuously jumping ($t= 4.455^{**}$, $p=.000 <0.001$), Balancing ($t=4.712^{**}$, $p=0.000 <0.001$), and in Total score ($t=3.624^*$, $p=0.001<0.05$).

Table 4.18 The comparison of preschoolers' physical fitness in two groups

Test	Variables	The experimental group (n=32) M \pm SD	The comparison group (n=33) M \pm SD	t	p
Pre-test	Return running	4.000 \pm .7620	3.697 \pm .6366	1.742	.086
	Horizontal jumping	3.563 \pm .7156	3.212 \pm .7809	1.884	.064
	Throwing	2.875 \pm 1.0080	2.697 \pm 1.2621	.627	.533
	Continuously jumping	4.063 \pm .9136	3.697 \pm .9838	1.551	.126
	Balancing	3.844 \pm 1.0809	3.606 \pm .8638	.981	.330
	Sitting and reaching	2.781 \pm 1.0697	2.667 \pm 1.0206	.442	.660
	Height	3.344 \pm .9019	3.424 \pm .9692	-.346	.730
	Weight	4.281 \pm 1.1426	4.758 \pm .6629	-2.048*	.046
	Total scores	28.750 \pm 3.7503	27.758 \pm 3.4098	1.117	.268
Post Test	Return running	4.031 \pm .8224	3.818 \pm .7687	1.079	.285
	Horizontal jumping	3.938 \pm .7594	3.182 \pm 1.0141	3.393*	0.001
	Throwing	3.438 \pm .7594	2.939 \pm 1.116	.136*	.040
	Continuously jumping	4.250 \pm .7620	3.333 \pm .8898	4.455**	.000
	Balancing	4.594 \pm .7121	3.576 \pm 1.0009	4.712**	.000
	Sitting and reaching	2.750 \pm 1.0473	2.515 \pm .8337	1.002	.320
	Height	3.438 \pm .8776	3.364 \pm 1.0252	.312	.756
	Weight	4.313 \pm 1.3060	4.818 \pm .5839	-2.025	.051
	Total score	30.750 \pm 3.3020	27.545 \pm 3.8004	3.624*	0.001

Note: * $p<0.05$, ** $p<0.001$

4.4.1.2 The comparison of preschoolers' physical fitness scores between pre-test and post-test in the experimental group

All the data tested in the experimental group in pre-test and post-test were the same. The orders of the data were kept in the same order. Moreover, all data satisfied normal distribution by means of Q-Q plots. According to paired Samples T-test, some degree of significant difference in several dimensions were presented in Table 4.19.

The results revealed that the average scores in all dimensions and the Total score in post-test were higher than that of the pre-test. There was significant difference in dimensions of Horizontal jumping ($t = -2.823^*$, $p = .008 < 0.05$), Throwing ($t = -3.483^*$, $p = .002 < 0.05$), Balancing ($t = -5.030^{**}$, $p = .000 < 0.001$), and in Total score ($t = -5.213^{**}$, $p = .000 < 0.001$).

Table 4.19 The comparison of preschoolers' physical fitness in the experimental group

Variables	Pre-test (n=32) M ± SD	Post-test (n=32) M ± SD	t	p
Return running	4.000 ± .7620	4.031 ± .8224	-.239	.813
Horizontal jumping	3.563 ± .7156	3.938 ± .7594	-2.823*	.008
Throwing	2.875 ± 1.0080	3.438 ± .7594	-3.483*	.002
Continuously jumping	4.063 ± .9136	4.250 ± .7620	-1.646	.110
Balancing	3.844 ± 1.0809	4.594 ± .7121	-5.030**	.000
Sitting and reaching	2.781 ± 1.0697	2.750 ± 1.0473	.183	.856
Height	3.344 ± .9019	3.438 ± .8776	-.902	.374
Weight	4.281 ± 1.1426	4.313 ± 1.3060	-.273	.786
Total scores	28.750 ± 3.7503	30.750 ± 3.3020	-5.213**	.000

Note: * $p < 0.05$, ** $p < 0.001$

4.4.1.3 The comparison of preschoolers' basic motor competencies between pre-test and post-test in two groups

All data satisfied normal distribution by means of Q-Q plots. According to Independent-Samples T-test, some degree of significant difference in some dimensions were presented in Table4.20.

In the pre-test, the average scores of the experimental group and comparison group were basically the same in all dimensions except for the Bouncing dimension. The experimental group was slightly higher than that of the comparison group, and there was no significant difference in all dimensions and Total score.

In the post-test, the average scores of the experimental group were higher than that of the comparison group in all dimensions and the Total score except for the Bouncing dimension. There was significant difference in dimensions of Throwing ($t= 2.257^*$, $p=.027<0.05$) and Dribbling($t= 2.431^*$, $p=.018<0.05$). The scores of the comparison group were still higher than that of the experimental group in Bouncing dimension, but there was no significant difference.

Table 4.20 The comparison of preschoolers' basic motor competencies in two groups

Test	Variables	The experimental group (n=32) M ± SD	The comparison group (n=33) M ± SD	t	p
Pre-test	Throwing	.813 ±.7378	.697 ± .5855	.700	.486
	Catching	1.219±.8322	1.303± .8095	-.414	.680
	Bouncing	1.469±.7613	1.500± .7620	-.433	.667
	Dribbling	1.156±.7233	.939 ±.7475	1.188	.239
	Total score1	4.656±1.8770	4.485± 1.8561	.370	.713
	Balancing	1.938±.2459	2.000± .0000	-1.460	.149
	Rolling	1.500± .7620	1.364± .8594	.676	.501
	Jumping	1.688±.5923	1.515±.5658	1.200	.235
	Running	2.000±.0000a	1.970± .1741	.984	.329
	Total score2	7.125±.9419	6.848± 1.2278	1.016	.313

Post-Test	Throwing	1.344±.7453	.909 ± .8048	2.257*	.027
	Catching	1.531±.7177	1.424± .7918	.570	.570
	Bouncing	1.594±.6652	1.727± .5741	-.867	.389
	Dribbling	1.688±.5351	1.303± .7282	2.431*	.018
	Total score1	6.156±1.8335	5.364± 1.7106	1.803	.076
	Balancing	2.000±.0000a	2.000± .0000a	/	/
	Rolling	1.813 ±.5923	1.667± .5951	.99	.326
	Jumping	1.813±.4709	1.697± .6366	.830	.410
	Running	2.000±.0000a	2.000± .0000a	/	/
	Total score2	7.625±.7071	7.364± .9624	1.24	.218

Note: * p<0.05, ** p<0.001

4.4.1.4 The comparison of preschoolers' basic motor competencies between pre-test and post-test in the experimental group

All the date tested in the experimental group in pre-test and post-test were the same. The orders of the data were kept in the same order. According to paired Samples T-test, some degree of significant difference in several dimensions were presented in Table 4.21.

The results revealed that the average scores in all dimensions and the Total score in post-test were higher than that of the pre-test. There was significant difference in dimensions of Catching ($t= -2.154^*$, $p=.039<0.05$), Rolling ($t= -2.985^*$, $p=.005<0.05$), Throwing ($t=-4.477^{**}$, $p=.000<0.001$), Dribbling ($t= -4.477^{**}$, $p=.000<0.001$), also in Total score of Object control (Total score1) ($t= -6.313^{**}$, $p=.000<0.001$), and Total score of Self-movement (Total score2) ($t= -3.088^*$, $p=.004<0.05$).

Table 4.21 The comparison of preschoolers' basic motor competencies in the experimental group

Variables	Pre-test (n=32) M ± SD	Post-test (n=32) M ± SD	t	p
Throwing	.813±.7378	1.344 ±.7453	-4.477**	.000

Catching	1.219±.8322	1.531±.7177	-2.154*	.039
Bouncing	1.469±.7613	1.594±.6652	-1.161	.255
Dribbling	1.156±.7233	1.688±.5351	-4.477**	.000
Total score1	4.656±1.8770	6.156±1.8335	-6.313**	.000
Balancing	1.938±.2459	2.000±.0000a	-1.438	.161
Rolling	1.500±.7620	1.813±.5923	-2.985*	.005
Jumping	1.688±.5923	1.813±.4709	-.941	.354
Running	2.000±.0000a	2.000±.0000a	/	/
Total score2	7.125±.9419	7.625±.7071	-3.088*	.004

Note: * P<0.05, ** P<0.001

4.4.1.5 The comparison of preschoolers' perceived physical competence in two groups

In analyzing preschoolers' perceived physical competence from preschoolers' data, All data satisfied normal distribution by means of Q-Q plots. According to Independent-Samples T-test, the result in Table4.22 revealed that the average scores of the experimental group and the comparison group were basically the same in all dimensions; there was no significant difference. The mean scores in 5 dimensions are relatively high, but the score in Tying shoelace is much lower than in other dimensions in two groups. In the pre-test, the Total score of the comparison group is slightly higher than that of the experimental group, while just the reverse in the post-test.

Table 4.22 The comparison of preschoolers' perceived physical competence in two groups

Test	Variables	The experimental group (n=32) M ± SD	The comparison group (n=33) M ± SD	t	p
Pre-test	Swinging	3.344± .8654	3.455± .8693	-.515	.608
	Climbing	3.313± .8958	3.182±.9170	.581	.56

	Running	3.531± .7613	3.485±.7953	.240	.811
	Hopping	3.469± .6713	3.667± .4787	-1.365	.178
	Tying shoelace	1.62± 1.0080	1.636± .8594	-.049	.961
	Skipping	2.78± 1.0994	2.939± 1.1710	-.561	.577
	Total score	18.06± 2.8504	18.364±2.5717	-.447	.656
Post-test	Swinging	3.500± .6720	3.545± .6657	-.274	.785
	Climbing	3.406± .9456	3.242± .9364	.702	.48
	Running	3.625± .5536	3.545± .6657	.523	.603
	Hopping	3.531± .7613	3.636±.4885	-.665	.509
	Tying shoelace	1.875± 1.1846	1.697± .8095	.705	.48
	Skipping	3.438± .7156	3.364± .9624	.350	.727
	Total score	19.375± 2.6730	19.030±2.5061	.537	.593

Note: * $p < 0.05$, ** $p < 0.001$

In analyzing teachers' rating of preschoolers' actual physical competencies, all data satisfied normal distribution by means of Q-Q plots. According to Independent-Samples T-test, some degree of significant difference in several dimensions were presented in Table 4.23.

In pre-test, the average scores of the comparison group were higher than that of the experimental group. There was significant difference in all dimensions: Swinging ($t = -2.068^*$, $p = .043 < 0.05$), climbing ($t = -2.451^*$, $p = .017 < 0.05$), Running ($t = -3.289^*$, $p = .002 < 0.05$), Hopping ($t = -3.977^*$, $p = .000 < 0.001$), and in Total score ($t = -5.998^{**}$, $p = .000 < 0.001$), but Tying shoelace.

In post-test, the Total score in the comparison group was slightly higher than that of the experimental group. The scores in the comparison group were higher than that of the experimental group in some dimensions. There was significant difference in dimensions of Swimming ($t = -3.027^*$, $p = .004 < 0.05$), Climbing ($t = -3.376^*$, $p = .002 < 0.05$), and Hopping ($t = -3.613^*$, $p = .001 < 0.05$). However, the score of Tying shoelace in the experimental group was higher than that of the comparison group, and there was a significant difference in Tying shoelace ($t = 2.525^*$, $p = .015 < 0.05$).

Table 4.23 The comparison of teachers' rating of preschoolers' actual physical competencies

Test	Variables	The experimental group (n=32) M ± SD	The comparison group (n=33) M ± SD	t	p
Pre-test	Swinging	2.906 ± .7771	3.303 ± .7699	-2.068*	.043
	Climbing	2.813 ± .8958	3.333 ± .8165	-2.451*	.017
	Running	2.750 ± .7184	3.364 ± .7833	-3.289*	.002
	Hopping	2.688 ± .5351	3.394 ± .8638	-3.977*	.000
	Tying shoelace	1.125 ± .4212	1.030 ± .1741	1.178	.246
	Skipping	2.156 ± .6773	3.424 ± 1.0009	-5.998**	.000
	Total score	14.438± 2.8730	17.848± 2.7964	-4.8518*	.000
Post-test	Swinging	3.063 ± .7156	3.545 ± .5641	-3.027*	.004
	Climbing	3.500 ± .6222	3.909 ± .2919	-3.376*	.002
	Running	3.375 ± .5536	3.030 ± .8833	1.878	.065
	Hopping	2.938 ± .7156	3.576 ± .7084	-3.613*	.001
	Tying shoelace	1.750 ± 1.1359	1.182 ± .5839	2.525*	.015
	Skipping	3.531 ± .6713	3.667 ± .7360	-.774	.442
	Total score	18.156± 2.9305	18.909± 2.4285	-1.129	.263

Note: * p<0.05, ** p<0.001

4.4.1.6 The comparison of teachers' rating of preschoolers' actual physical competencies in the experimental group

All the data tested in the experimental group in pre-test and post-test were the same. The orders of the data were kept in the same order. According to paired Samples T-test, some degree of significant difference in several dimensions were presented in Table4.24.

The result revealed that the average scores in all dimensions and the Total score in post-test were higher than that of the pre-test. There was significant difference in dimensions of Tying shoelace ($t = -2.856^*$, $p = .008 < 0.05$), Climbing ($t = 5.614^{**}$, $p = .000 < 0.001$), Running ($t = 5.000^{**}$, $p = .000 < 0.001$), Skipping ($t = -10.352^{**}$, $p = .000 < 0.001$), and in Total score ($t = -8.867^{**}$, $p = .000 < 0.001$).

Table 4.24 The comparison of teachers' rating of preschoolers' actual physical competencies

Variables	Pre-test (n=32)	Pos-test (n=32)	t	p
	M ± SD	M ± SD		
swinging	2.906 ± .7771	3.063 ± .7156	-1.000	.325
climbing	2.813 ± .8958	3.500 ± .6222	5.614**	.000
running	2.750 ± .7184	3.375 ± .5536	-5.000**	.000
hopping	2.688 ± .5351	2.938 ± .7156	-1.761	.088
tying shoelace	1.125 ± .4212	1.750 ± 1.1359	-2.856*	.008
skipping	2.156 ± .6773	3.531 ± .6713	-10.352**	.000
total score	14.438 ± 2.8730	18.156 ± 2.9305	-8.867**	.000

Note: * $p < 0.05$, ** $p < 0.001$

4.4.1.7 The correlation of preschoolers' physical fitness, basic motor competencies and perceived physical competence

The correlations between Physical fitness, Basic motor competencies, and Perceived physical competence were analyzed. Physical fitness, Basic motor competencies, and Perceived physical competence tested between pre-test and post-test were designated as independent variables for analysis of bivariate correlations. A few significant relationships were presented as Table 4.25 below through correlation analysis.

Results revealed that teachers' rating of actual physical competencies was positively related to preschoolers' physical fitness, and basic motor competencies in the

pre-test (Teacher' rating of actual physical competencies & Physical fitness, .547**, p=.004 < 001; teacher' rating of actual physical competencies & Basic motor competencies, .384*, p=.030 < 0.05), and in post-test(teacher' rating of actual physical competencies & preschoolers' physical fitness, .434*, p=.013 < 0.05; teacher' rating of actual physical competencies & preschoolers' basic motor competencies, .450**, p=.010) however, no significant relation with preschoolers perceived physical competence was found. Meanwhile, there was no significant relation between preschoolers' perceived physical competence and Physical fitness , between preschoolers' perceived physical competence and Basic motor competencies.

Table 4.25 Correlations between Physical fitness, Basic motor competencies and Perceived physical competence

Correlations					
Experimental group			Physical fitness	Basic motor competencies	Teacher' rating of actual physical competencies
Pre-test	Preschoolers' perceived physical competencies	Pearson Correlation	.064	.188	-.007
		sig(2-tailed)	.726	.303	.968
	Teacher' rating of actual physical competencies	Pearson Correlation	.547**	.384*	1
		sig(2-tailed)	.001	.030	/
Post-test	Preschoolers' perceived physical competencies	Pearson Correlation	-.022	.126	-0.12
		sig(2-tailed)	.905	.490	.949
	Teacher' rating of actual physical competencies	Pearson Correlation	.434*	.450**	1
		sig(2-tailed)	.013	.010	/

Note: *. Correlation is significant at the 0.05 level(2-tailed).

** . Correlation is significant at the 0.01 level (2-tailed).

From the above data analysis, the new PE curriculum has a positive effect on preschoolers' PL development and class teachers' development. There are some conclusions that come from the experimental group:

(1) Preschoolers made significant progress in physical fitness development in the dimensions of Horizontal jump, Throwing, and Balancing.

(2) Preschoolers made significant progress in Basic motor competencies development in the dimensions of Catching, Rolling, Throwing, and Dribbling.

(3) Preschoolers could not make accurate judgments about their physical competence.

(4) Class teachers improved their ability to make an accurate judgment about preschoolers' physical competence.

4.4.2 The PE teacher's development in the experiment group

Teacher's professional development is an important part of evaluating the effect of curriculum implementation (Wang, 2018). Teachers' professional development includes teachers' professional philosophy and professional ethics, professional knowledge, and professional ability (Ministry of Education, 2012). Two PE teachers were involved in this study to teach different groups. There was no intervention on the PE teacher who taught the comparison group. However, there was significant intervention on the PE teacher who taught the experimental group. In constructing the new PE curriculum, there was a large amount of discussion about all the components of the PE curriculum. The PE teacher read much material about the research topic to make himself clearly view the new PE curriculum from a systematic perspective and constantly adjust his ideas and actions to concentrate on fostering preschoolers' PL in his teaching. The PE teacher who taught the experimental group showed professional development from his reflection (*In this PE curriculum reform, compared with the past, what changes do you think you have experienced? 9.1.2019*) and the author's observation (*field notes*). Here are some changes happened in three professional dimensions in some domains.

4.4.2.1 Development in professional philosophy and professional ethics

Professional philosophy and professional ethics involve four dimensions in professional understanding and cognition, attitude and behavior towards students,

education and teaching, and self-development. In this study, the PE teacher made progress in changing his attitude and behavior to children and education.

- **Changed the attitude and behavior of children**

“I communicate with children to know their ideas about physical activities at the end of the physical fitness class. I will prepare class according to their ideas to protect their interest. I hardly did that before. I give more appropriate instructions to children individually and encourage them to try. I try to give feedback to more children privately. Then they know how to do better, and they are happy with their progress (PET 1).”

And the end of the class, the PE teacher sat down with children on the playground, talked with children about their feeling of the activity, discussed their challenge in the activity, and shared how they could do better next time. (Field notes 15.10.2018)

- **Changed the attitude and behavior of early childhood education**

“I give children more chances for them to explore the environment. I encourage them to show us how to use their bodies freely and how to use the equipment creatively. I want them to learn positively not to learn passively by just listening to the teacher(HI).”

At the beginning of the class, the PE teacher did not put the equipment in the planned place. He asked children to move the material and construct the “balance bridge” by themselves. Children were excited to do that. (Field notes, 5.11. 2018)

The PE teacher was trying to change from teacher-centered to children-centered in teaching, showing his respect for children, expressing his love for children, and listening to the voice of children. He was changing his position in teaching from standing in front of children to stay with children and stay behind children.

4.4.2.2 Development in professional knowledge

The professional knowledge has three dimensions: the knowledge of child development, the knowledge of early childhood education and childcare, and general knowledge. The PE teacher learned a lot about children’s development in PE.

- **Got more knowledge about children’s PE.**

“ I understand children’s development in kindergarten PE more clearly. I begin to think about PE curriculum from a systematic perspective to improve children’s whole development. All the components of the PE curriculum should work together to improve children’s development. I care about the goal of PE and the ability of children. I do more observation on children to know their development levels and find strategies to improve their development (PET 1).”

The process of constructing the kindergarten PE curriculum is a process that the PE teachers learn continuously. They have professional knowledge and experience in teaching, so they have no motivation to move forward. When they have to construct the kindergarten-based PE curriculum, they have high pressure to share their ideas which need to be written down in word. They read many related books and documents to reinforce their understanding of the value of PE. They care more about preschoolers’ whole development.

4.4.2.3 Development in professional ability

The professional ability has six dimensions: create and utilize the environment, organize a day of activities , support and instruct games, plan and implement educational activities, inspire and evaluate, communicate and cooperate, reflect, and develop. The PE teacher developed in four of the dimensions.

•Created the learning environment positively

“Every day I spend much time to think about how to use the current environment and equipment to inspire children’s learning than before. I care more about the teaching goals and children’s development levels. I consider and arrange sports materials from a more scientific perspective to improve children’s learning efficiency. I try to bring children to explore the natural environment outside the kindergarten to enrich children’s movement experiences. Children are happy to go out, and they are more creative and active outside (PET 1).”

The goals and objectives of the PE curriculum were discussed and written down distinctly. Each physical fitness class had clear objectives. The PE teacher tried to use the familiar materials to set the task and the objectives which contained in the activity tasks. When the children accomplished the tasks, they achieved the objectives. Children

can also assess their ability by themselves during the process. The PE teacher is trying to innovate his way of organizing physical activities to create a mastery motivational climate. It takes him more time to design the tasks appropriately. (Field notes,19.11.2018)

• Planned and implemented educational activities by heart

“In designing physical activities, I try to give children more independence and try to design a variety of activities. Children have more time for effective exercise and more opportunities for activities than before. I have a stronger sense of purpose in the teaching process. I care about individual differences than before. I do more observation on children, assess children’s development precisely, and give children more individualized instructions (PET 1).”

Children were clear about their tasks in the activity in the experimental group. They actively took their ball to make a breakthrough successfully. It was not easy for them to dribble the football only with foot and not touch the barriers. The PE teacher observed them and gave individual instructions on how to control the ball patiently. (Field notes.26.11.2018)

•Inspired and evaluated children effectively

“I try to find children’s progress and give them positive feedback individually. I encourage them to try their best and get progress. They are delighted when they accomplish the tasks successfully . They show more enthusiasm and confidence in their activities(H1).”

In mastery motivational climate, the PE teacher does not need much time to control the children; he has more time to observe children and gives children varied feedback. He gives preschoolers instruction individually and patiently. Children are very excited to get feedback from the PE teacher.(Field notes. 17.12.2018)

•Communicated with class teachers and children actively

“I communicate with class teachers less before, I think class teachers are inactive, I’m not in the mood to guide them. However, now I think class teachers play an important role to improve children’s PL development. They have more time to stay with children and know children well. I begin to communicate with class teachers

consciously, I patiently give them instructions on how to organize physical activities and they can do better. It is getting better and better to communicate with them. I think it is also important to talk with children. After listening to their ideas, I can understand their interest and expectation well. Their ideas also inspire me to design funnier physical activities for them.”

•Did more self-reflection

“I think I have no time to reflect myself before. Now I think reflection is necessary and I reflect myself actively during and after the class. I reflect comprehensively about children’s emotion, participation, amount of exercise, and also goal achievement, game setting to analyze the age appropriate of the physical activities, then do adjustment in a later class. I think I need to use stories and music to make activities more interesting. I begin to think of my teaching from the perspective of children(PET I).”

PE teachers play an important role in constructing the new PE curriculum. It is also a process of professional development for them. They need attention and dialogue which can inspire them develop their professional ability. They need to practice, evaluate, reflect, and modify the PE curriculum all the time for continual improvement and maintaining professional responsibility.

In summary, from the results of preschoolers’ development and the teacher’s development, it showed that the new kindergarten PE curriculum had a positive effect on preschoolers’ PL development and teachers’ professional development.

Chapter 5 Discussion and conclusion

The chapter includes seven parts. Part one, the necessity to refine the kindergarten PE curriculum, the current situation of the kindergarten PE curriculum is described. Part two, it is a process of teamwork to construct a systematic PE curriculum in the kindergarten, the primary process of constructing the kindergarten PE curriculum is described. Part three, Kindergarten physical education curriculum is a system of five interrelated components, the features of the new kindergarten PE curriculum are described. Part four, the new kindergarten PE curriculum has been proved to be effective, the result of the quasi-experiment and the reasons are discussed. Part five, it is a dynamic exploration journey full of challenges to refine kindergarten PE curriculum, challenges encountered in constructing a systematic PE curriculum are described. Part six, limitations and further recommendations, limitations in the study, and further recommendations for making the new PE curriculum better are discussed. Part seven, the research conclusion, based on the research results presented before, the following research questions have been responded in this chapter in the conclusion part. What are the features of the new kindergarten PE curriculum underpinned by fostering preschoolers' physical literacy? How does the new kindergarten PE curriculum work?

5.1 There is a tendency to construct a systematic PE curriculum in kindergarten

In recent years, with the exposure of children's obesity, nearsightedness, the deterioration of physical fitness, and other health problems, it has become a common concern of the whole society to offer quality physical activities for children. Moreover, kindergarten PE also encountered an opportunity to develop. The curriculum reform of primary education in China has been intensively launched. The PE curriculum system in primary and secondary schools has been continuously improved. A group of researchers expanded their research into the preschools to explore the appropriate movement curriculum for children. Three newly issued documents, including *National fitness program for 2016-2020* (The State Council, 2016), *Guidelines of sports for Children Ages 3-6* (2018), *Guidelines on physical activity, sedentary behavior and*

sleep for children under 5 years of age (WHO, 2019) , provided useful guidance for kindergarten teachers to organize physical activities scientifically, and also pointed out requirements for high-quality kindergarten PE. There will be a tendency to clarify the current situation of kindergarten PE curriculum, and construct a systematic kindergarten-based PE curriculum to enhance the quality of PE in kindergarten.

The current situation of the PE curriculum in SNU Kindergarten is a miniature of many kindergarten PE curriculum in China. There is no specific policy for the construction of the PE curriculum in kindergartens in China. Kindergarten teachers lack motivation and support to construct the PE curriculum, which raises concerns for the PE curriculum. From the perspective of PE teachers, most of the PE curriculum was “in their mind,” and the curriculum system was in an imperfect state. From the perspective the class teachers, they lacked the PE background and could not outline the whole picture of the PE curriculum, and the PE curriculum system remained unknown. As a result, kindergarten PE teachers and class teachers could not reach a consensus on the objectives of the PE curriculum, the content of the PE curriculum, the implementation of the PE curriculum, and the evaluation of the PE curriculum. They taught in their own way. Consequently, the existing problems in kindergarten PE could not be solved. The quality of kindergarten PE was affected, which hindered the development of children. Kindergartens needed to integrate multiple resources to support PE teachers who acted as the leaders to complete the construction of the kindergarten PE curriculum.

5.2 It is a process of teamwork to construct a systematic PE curriculum in kindergarten

In this study, the construction of the PE curriculum was completed by the cooperation of multiple stakeholders, headmasters, PE teachers, class teachers, preschoolers’ parent, and curriculum expert involved in a research team. Each person played a variety of roles in the process.

The curriculum expert provided academic support and guidance for curriculum construction and guided the direction of curriculum construction from the aspects of

goal formulation, content selection, methods of implementation, and strategy of evaluation.

The headmaster provided various supports from the administrative perspective. Firstly, she provided sufficient equipment to ensure the implementation of the curriculum. Secondly, she offered chances for herself and PE teachers to study beyond their kindergarten and improve their professional level. Then they made an agreement on many issues in the PE curriculum reform. Thirdly, she bought many professional books for PE teachers to improve their theoretical level. Fourthly, she provided a policy to guarantee the time of the PE curriculum. The vice headmaster cared about the effective implementation of the curriculum, providing teachers with useful advice regarding the accuracy of the objectives, the appropriateness of the content, the scientific aspects of implementation, to make sure that the educational philosophy of PE curriculum was aligned with the educational philosophy of the kindergarten.

PE teachers acted as the leaders in constructing PE education curriculum. They discussed the way to clearly delineate the objectives of the PE curriculum, the proper arrangement of curriculum content, the effective way of curriculum implementation, and the effective strategies of curriculum evaluation. They spent lots of time going through much information to verify their ideas and to write down them. Class teachers actively took part in this process. On the one hand, they assisted PE teachers to organize physical activities in PE classes, at the same time observed and understood children's development levels in this process. On the other hand, they organized physical games according to the goal system of the PE curriculum and the children's current level.

Children's parents mainly provided their opinions on the development of kindergarten physical activities from their perspectives.

The cooperation in the teamwork has changed PE teachers' "fighting alone" situation and enabled PE teacher to overcome difficulties and built a systematic kindergarten PE curriculum finally.

5.3 The kindergarten physical education curriculum is a system of five interrelated components

It was a big problem to emphasize the partial and neglect the whole of the kindergarten PE curriculum in China mentioned before. In this study, the author tried to follow the ABC model to explore how to systematically construct a kindergarten PE curriculum which was suitable for Chinese culture. According to the current situation of the SNU Kindergarten, the kindergarten PE curriculum was refined from a systematic perspective, and the features of the five components were described. Any other kindergartens can construct a systematic PE curriculum according to them.

5.3.1 Curriculum philosophy is described clearly as the basis of understanding curriculum

Curriculum philosophy offers the orientation of curriculum development. Each kindergarten should determine its own PE curriculum philosophy according to its actual situation. Many kindergartens do not have a clear PE curriculum philosophy. In this study, the curriculum philosophy contains three aspects according to the existing problems of the PE curriculum. The first one is the value of physical activities. The value of physical activities for children's development is explained in the PE curriculum philosophy. It is an important step to attract parents' and teachers' attention to kindergarten physical activities together. The second one is the goal of the PE curriculum in general. It is easy for teachers to have an overall understanding of the curriculum goal when it is positioned to foster children's PL. The third one is the duties of all stakeholders. It is a difficult task to achieve the curriculum objectives, which requires all stakeholders to clarify their responsibilities and accomplish them together. It will create a pleasant environment for the development of kindergarten physical activities by offering a clear curriculum philosophy.

5.3.2 Curriculum goals are delineated in general and in specific as the axis of curriculum development

The establishment of curriculum goals directly affects the establishment of other components of the curriculum system. It is an obvious problem that the goals of

kindergarten PE curriculum are not comprehensive enough in general and not clear enough in specific from the literature review and interview with teachers. Even if some researchers advocated the goals of kindergarten PE from the three dimensions of physical competence, physical morality, and healthy behavior (Wang & Zhao, 2018). It covered a wide range and many of them cannot be achieved in kindergarten PE.

In this study, according to the concept of physical literacy, the goals of PE curriculum include physical competence, cognitive, and affective aspects. They are in line with the perspective of whole child development. The specific goals to be achieved from three aspects in K3 are explicitly listed. These goals are selected according to children's development status and kindergarten conditions.

All the FMS objectives are operationally defined in detail in terms of both process and product. The observational instruments are created on this basis. Though the cognitive and affective parts are defined in general, they can be integrated into the process of curriculum implementation and can be observed from children's responds (ACE) to some extent. In curriculum implementation, teachers try to design interesting tasks (physical activities) to motivate children to take an active part in them. The process to accomplish all the tasks is a process to experience the challenge and gain success (motivation), confidence, and joy. In this process, teachers can observe children's attention and effort in the tasks from the affective perspective and the comprehension of tasks from the cognitive perspective. The description of kindergarten PE curriculum goals is more specific, feasible, and observable. Kindergarten teachers and parents can have a clear understanding of the goals of kindergarten PE curriculum. Kindergarten teachers can design physical activities according to the specific objectives and can assess children's development by using corresponding observational instruments.

5.3.3 The comprehensive content of PE curriculum is listed as the carrier to achieve the curriculum goals

At present, there was a lack of reasonable choices and plans for kindergarten PE curriculum content. Kindergarten teachers, especially the class teachers, organized physical activity at their will. In this study, the selection of curriculum content is closely

based on the goals. The selection of content should take into consideration the curriculum objectives and children's real life experience. The curriculum content should originate from children's life and arouse children's movement experiences. In this study, the teacher thoroughly considered the weather, the environmental conditions of the kindergarten, and children's development level, then arranged the curriculum content into each week, to fully guarantee the sufficient time of curriculum implementation.

5.3.4 The principle of creating a mastery motivational climate in curriculum implementation acts as the key to achieve curriculum objectives

It is a severe problem in the current kindergarten PE curriculum that children have low autonomy and have to waste time to wait for a long time in a performance climate. It dramatically reduces the time for children to exercise effectively. In this study, a mastery motivational climate is advocated to guarantee maximum teaching and effective learning. In this kind of climate, preschoolers have more freedom to interact with the environment positively. PE teachers can spend more time observing and instructing children. They can design more appropriate physical activities based on a better understanding of children's development level. Class teachers can imitate PE teachers' teaching more easily by observing. They are willing to try to organize physical games purposefully in practice.

5.3.5 The combination of formative evaluation and summative evaluation is an effective way to monitor the curriculum effect

Curriculum evaluation is the feedback of curriculum effect. The purpose of curriculum evaluation is to promote development. That is to monitor whether the curriculum can promote children's development, teachers' development, and curriculum development. The evaluation of children is an important way to understand children and also a means for teachers to evaluate their teaching effects. Formative evaluation is popular with other countries to promote children's development. At present, kindergarten PE curriculum evaluation is at a superficial level and is not implemented in many kindergartens.

In this study, the formative evaluation is strengthened than before. Data can be collected in the teaching process through the observation instruments created before to understand children's motor skill development. That is why class teachers improved their ability to make an accurate judgment on preschoolers' physical competence. Teachers can adjust their teaching plan according to the collected information, to achieve the purpose of promoting children's development through assessment. The most crucial way for teacher evaluation is self-reflection due to the particularity of PE. PE teachers have professional knowledge with which they can make a comprehensive and objective evaluation of the educational concept, educational attitude, educational behavior, and educational effect. A movement story is a useful way for teachers to record children's activities in learning and the teachers' reflection and implications.

The summative evaluation is extended than before. Physical competence as a part of PL includes FMS and physical fitness. The physical fitness test is relatively common in China. In this study, both preschoolers' physical fitness and basic motor competence are tested to show preschoolers' development more deeply. Teachers were shocked to see the low scores of preschoolers' basic motor competence which they never tested before. Moreover, they began to adjust in their teaching and cared about preschoolers' mastery of motor skills.

5.4 The new kindergarten physical education curriculum has a positive effect on preschoolers and teachers

According to the theory and practice, a systematic kindergarten PE curriculum underpinned by fostering preschoolers' PL was constructed. A quasi-experiment in one class was conducted to test it. The experimental results showed that the new PE curriculum played a positive role.

On the one hand, preschoolers in the experimental group made significant progress. Preschoolers improved their physical fitness significantly in total and especially in Horizontal jumping, Throwing, and Balancing dimensions. Preschoolers also improved their basic motor competencies both in Object control and self-management, especially in Catching, Throwing, Dribbling, and Rolling dimensions. Preschoolers' progress is due to changes in teachers' ideas and teaching methods. The PE teacher had a

systematic PE curriculum in his mind. His awareness of goals has increased. According to the clearly described objectives, the PE teacher designed physical activity with clear objectives and thoroughly considered the way to achieve the objectives. In the mastery motivational climate, the PE teacher changed his way of teaching, and he let children take the initiative to complete tasks and achieve development goals after clear informing them their goals. Thus, the time children spending in waiting decreased; they concentrated on tasks more deeply. The quality of physical activity was improved. Teachers had more time to give attention to individual children and gave feedback individually. The quality of teacher-child interaction got better than before.

Preschoolers cannot make an accurate judgment about their physical competence in general as Harter and Pike (1984) suggested that children under the age of seven were unable to do that. Whitehead (2001) highlighted that inaccurate judgment made by young children may be a result of limited experience in judge ability levels in relation to others. Teachers should help preschoolers enrich their movement experiences and make them assess themselves accurately gradually. If they do not have relevant movement experiences, they tend to have low perceive physical competence. Preschoolers explicitly declared that they cannot tie a shoelace because they do not have chances to tie shoelace in their life. Moreover, movement experiences can maintain preschoolers' motivation for physical activity and develop their PL in it.

On the other hand, teachers in the experimental group also made significant progress. It had a positive effect on class teachers. Class teachers improved their ability to assess preschoolers' physical competencies objectively. Their rating score for preschoolers' physical competence was positively correlated to preschoolers' physical fitness and basic motor competence, respectively. They gave higher scores to children on their actual physical competence in total and especially in Tying shoelace, Climbing, Running and Skipping dimensions in post-test. That was because class teachers understood the goals of preschoolers' development and invested more time in activities to observe and understand preschoolers' development level better.

It also has a positive effect on PE teachers. PE teachers are a particular group in kindergartens. They cannot get high-quality professional guidance from headmasters

and other class teachers. Their professional development was neglected to some extent. PE teachers were in a confused state and lacked the motivation to develop themselves. This study, as an external promotion, give PE teachers full play of their professional expertise to construct a systematic PE curriculum in their kindergarten, to lead the professional development of kindergarten teachers in the field of PE. PE teachers had a sense of value and responsibility in the process. As a result, PE teachers have made great progress in professional development.

5.5 It is a dynamic exploration journey full of challenges to refine kindergarten PE curriculum

The work to construct a systematic kindergarten PE curriculum is a big challenge for PE teachers. However, they make it step by step. The elaboration of curriculum objectives is a difficult task. PE teachers can only use much spare time to read references, especially in English, and write down their thought. They thought that such work was extra work for them, and they had no obligation to do it. However, they did it and made progress in steps.

In traditional performance climate, kindergarten PE teachers have been used to the traditional way to organize physical activities; they are very familiar with the way to highly control the process; they do not need much time to design. However, to create a mastery motivational climate, they have to change their ideas and focus on more practical design which they recognize that it is meaningful and valuable after practice.

“Small task” strategy effectively reduces the time children spending in waiting the physical activity. The PE teachers are satisfied with it and are willing to change and try.

When the author firstly proposed the PE teacher to create a mastery motivational climate in relation to TARGET class structure, the PE teacher thought that it was impossible to do it in the current situation. However, he tried, changed, and accepted the new way to organize physical activities finally. Not perfectly. However, it is worth looking forward to doing it. When it came to discuss teachers’ teaching reflection, the PE teacher said: *“I have no time to reflect; I have to teach one class after another.”* However, during the time, when he was waiting for the next class, he exchanged his ideas with the author about his reflection on his teaching design. What is more, his

reflection contributed to his adjustment in the following class. The PE teacher has developed through constant reflection, he was willing to do so, and he made it. Changes happened, but changes always happened bit by bit, not overnight!

5.6 Limitations and further recommendations for making the new PE curriculum better

This study is only the beginning of a long journey; there are some limitations in it; there is still a long way to go in the future.

(1) Only the PE curriculum for K3 in the first semester is designed because of the time limit. The following work is to complete the curriculum for K1, K2, K3 in a whole year.

(2) The quasi-experiment is done in one class to see how does the new curriculum work. The sample size is small, and the experiment time is not long enough. Later, the new PE curriculum will be used in more classes, and a relative complete curriculum evaluation scheme will be planned to conduct a comprehensive curriculum evaluation.

(3) Though the observation instruments are created in the new PE curriculum, it is difficult for teachers to use them in practice effectively. Later, more work should be done to discuss how to use them effectively and train teachers to use them appropriately, to achieve the value of the observation instruments.

(4) The kindergarten PE curriculum is constructed with physical fitness class as the core, while other forms of physical activities, such as physical games, movement center activities and morning exercises organized by class teachers, are not involved. The following research will focus on fostering preschoolers' PL by integrating all forms of physical activities in kindergarten.

The study lays the groundwork for future study. The perfection of kindergarten PE curriculum is full of challenges, teachers are willing to continue to explore, they dare to innovate, and they expect constantly progress.

5.7 The research conclusions

The study aim is to construct a systematic PE curriculum underpinned by foster preschoolers' physical literacy. According to the qualitative and quantitative data gathered before, here come the conclusions:

1. The kindergarten PE curriculum underpinned by fostering preschoolers' PL is a system of five interrelated components.

(1) The curriculum philosophy contains three parts including the value of physical activities, the goal of PE, and the duties of different stakeholders, to guarantee the environment of fostering preschoolers' physical literacy in kindergarten.

(2) The curriculum goals focus on three dimensions of PL, which are delineated clearly from physical competence, affective, and cognitive parts.

(3) The curriculum content is selected based on the three dimensions of the goals and originate from preschoolers' movement experiences.

(4) The curriculum implementation emphasizes the principle of creating a mastery motivational climate in relation to TARGET class structure to achieve maximum teaching and effective learning.

(5) The combination of formative evaluation and summative evaluation is an effective strategy to evaluate preschoolers' PL development.

2. The new kindergarten physical education curriculum has a positive effect on preschoolers' development and teachers' development

(1) Preschoolers in the experimental group made significant progress in physical fitness development in total, especially in the dimensions of Horizontal jumping, Throwing, and Balancing.

(2) Preschoolers in the experimental group made significant progress in basic motor competencies development of Object control and Self-movement, especially in the dimensions of Catching, Rolling, Throwing, and Dribbling.

(3) Preschoolers could not make accurate judgments about their physical competence.

(4) Class teachers in the experimental group made significant progress in making accurate judgments about preschoolers' physical competence in total, especially in dimensions of Tying shoelace, Climbing, Running, and Skipping.

(5) The PE teacher in the experimental group made progress in professional development in three dimensions.

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Appendix A Semi-structure interview with kindergarten class teachers

1. Would you like to organize movement games? Why or why not?
2. How do you think of organizing movement games? Difficult or easy? Why?
3. what is challengeable for you in organizing movement games?
4. What kind of help do you need to help you improve in organizing movement games?

Appendix B Activity Observation and Analyses Form

Class:	Time:	Numbers of children:	teacher:
Content			
Goal			
Material and place			
Process			
Teacher's reflection			
Observer's assessment			

AppendixC Physical education curriculum philosophy worksheet

This worksheet is created to help you identify the major point that may be included in the kindergarten PE curriculum philosophy statements. These are provided as guidelines, you can emphasize some points or and some depending on the situation of the kindergarten.

1. Why all preschoolers need PE?
2. What benefits preschoolers can gain from PE?
3. How the PE curriculum is linked to the kindergarten curriculum?
4. How the PE curriculum is linked to community interests and values?
5. How much time can be offered for PE in K3 every week? And how about physical games, movement center activity?
6. What is the qualification of PE teachers to implement the PE curriculum?
7. What are the policies and resources (in general terms) needed to effectively implement the curriculum?
8. Who should involve in the PE curriculum development process?
9. What process is used by the committee to develop the curriculum?
10. What goals will the preschoolers achieved when they complement the curriculum?
11. What are the benefits of preschoolers achieving these goals?
12. Other information you want to add in.

AppendixD Preschoolers' Physical Fitness Test form

Class of children: k1 k2 k3

The number of children:

The name of children:

The birth date(month, year):

Gender : Male Female

Name of the tester:

Items	1 Try	2 Try	Score	Remarks
Height(cm)	/			
Weight (kg)	/			
10-meter return running (second)	/			
Horizontal jumping (cm)				
Tennis throwing away (m)				
Continuously jumping on both feet(second)				
Sitting and reaching(cm)				
Balance beam walking (second)				

Appendix E Evaluation table MOBAK-KG test instrument

Area			Object movement				Self-movement					
Item			throwing	catching	bouncing	dribbling		Balancing	rolling	jumping	running	
trials			6	6	2	2		2	2	2	2	
evaluation			0-2 hits / passed attempts = 0 pts. 3-4 hits / passed attempts = 1 pt. 5-6 hits / passed attempts = 2 pts.		0 passed attempts = 0 pts. passed attempts = 1 pt. passed attempts = 2 pts.			0 passed attempts = 0 pts. 1 passed attempts = 1 pt. 2 passed attempts = 2 pts.				
No	name	F/M	hits /Pts.	Passed/ pts.	Points	Points	Total	Points	Points	Points	Points	total
Item average												
Class average			Object movement					Self-movement				

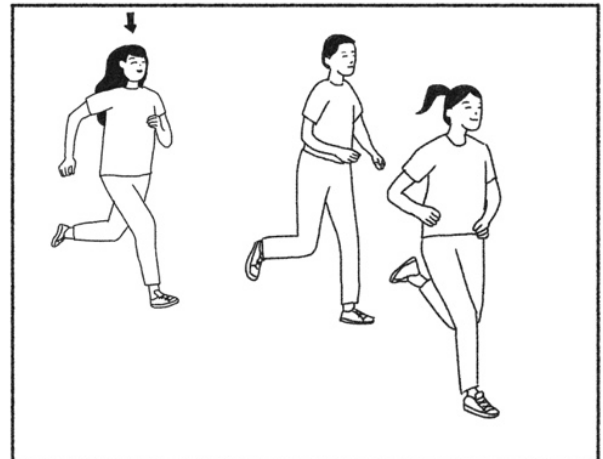
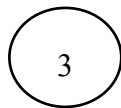
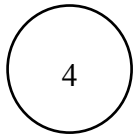
AppendixF Harter scale questions (one example)

Item 15

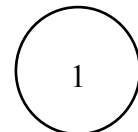
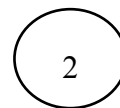


This girl is pretty good at running, Are you :

Really good at running or Pretty good



Sort of good or Not too good at running



AppendixG Teachers' rating scale of children's actual physical competence

Time: **rater:**

Instructions: place the appropriate number indicating how true the statement for this child in the designated space to the right of each item.

Not very true=1, Sort of true =2 , Pretty true=3 , Really true =4

Items Name of children	3 Good at swinging	6 Good at climbing	9 Good at Tying shoelaces	12 Good at skipping	15 Good at running	18 Good at hopping	Total

AppendixH The observation instruments for 20 motor skills

1. Walk

Giving little time to rest, preschoolers can walk more than 1.5 kilometers continuously. During the process, try to demonstrate the following performance standards:

1. **Eyes** focus forward
2. **Head** and **trunk** stable and facing the front
3. **Arms** swing back and forth naturally
4. **legs** step big stride alternatively to the front with tiptoes forward

Table1 the observation instrument for walking

Names	Process				Product (minutes)	
	Eyes	Head and trunk	Arms	Legs step big stride, tiptoes forward	Target: succeed	
	focus forward	stable	swing	stride, tiptoes forward	Pre-(minutes)	Post-(minutes)

2. Run

Given a verbal request and a demonstration, preschoolers will try to run fast at least 25cm far in 6 - 6.4 seconds. On one out of two trials, while trying to demonstrate the following performance standards:

1. **Eyes** look forward
2. **Head** and **trunk** lean forward slightly and facing the front
3. **Arms** swing vigorously back and forth with **elbows** bent at 90 degrees
4. **Legs** push off the ground hard backward
5. **Feet** close to buttocks and land on the ground with the forefoot

Table2 the observation instrument for running

Names	Process					Product (seconds)	
	Eyes look forward	Head and trunk forward	Arms swing vigorously, elbow bent	Legs push hard	Feet close to buttocks and land with forefeet	Target: Girl: 6 seconds Boy: 6.4 seconds	
						Pre- (time)	Post- (time)

3.Run-up cross

Given a verbal request and a demonstration, preschoolers will try to run-up across obstacles (60cm wide and 40cm high) successfully. On one out of two trials, while trying to demonstrate the following performance standards:

1. **Trunk** leans forward slightly
2. **Feet** run up a short distance with medium speed before jumping
3. The jumping **leg** pushes off the ground firmly, the swinging leg bend **knees** fast to swing forward.
4. Two **arms** swing naturally

Table3 the observation instrument for run-up cross

Names	Process				Product (Y/N)	
	Trunk leans forward	Feet run-up	Jumping leg pushes firmly, swinging leg bend knee to swing forward	Arms swing	Target: succeed	
					Pre-	Post-

Note: Y= passed, N= not passed

4. Vertical jump

Given a verbal request and a demonstration, preschoolers will try to jump as high as he/she can to touch a target 25-30cm away from the end of the finger. On one out of two trials, while trying to demonstrate the following performance standards:

1. **Head** up, **trunk** upright
2. **Arms** swing behind body and **knees** bend before jumping
3. **Arms** swing up and **Legs** forcefully extend when jump
4. One **hand** extends upward to touch the target
5. **knees** bend on landing

Table 4 the observation instrument for vertical jumping

Names	Process					Product (cm)	
	Head up, Trunk upright	Arms swing behind, knees bend	Arms swing up, Legs extend	hand extends	Knees bend on landing	Target: Girl:25cm Boy:30cm	
						Pre-	Post-

5. Horizontal jump

Given a verbal request and a demonstration, preschoolers will try to jump at least 100-110 cm far. On one out of two trials, while trying to demonstrate the following performance standards:

1. **Eyes** focus forwards
2. Bend both **knees** slightly
3. Swing both **arms** from front to back
4. Two **feet** push off the ground firmly and take off together
5. Jump forward with **legs** straightened
6. Balance landing with both **feet** on the ground together

Table 5 the observation instrument for horizontal jumping

Names	Process						Product (cm)	
	Eyes	Knees	Arms	Feet	Legs	Feet	Target:	
	focus forward	bend	swing	Push firmly, take off together	straighten	land on together	Girl:100cm Boy:110cm	
							Pre-	Post-

6. Overhand throw

Given a verbal request and a demonstration, preschoolers will throw the tennis to a target 5-7m away. On two out of three trials, while trying to demonstrate the following performance standards:

1. **Eyes** focused on the target.
2. Step towards the target with the **foot** opposite the throwing arm during the throw
3. Throwing **arm** nearly straightened near the shoulder
4. **Hip** and **spine** rotation in preparation for and during the throwing action
5. Throwing **arm** follows through down and across the body.

Table 6 the observation instrument for Overhand throwing

Names	Process					Product (m)	
	E	Step forward	Throwin	Hip	Throw	Target:	
	yes focused target	with foot opposite throwing arm	g arm straightened	and spine rotation	ing arm follow down	Girl:5m Boy:7m	
						Pre-	Post-

7.Climb

Given a verbal request and a demonstration, preschoolers can climb 5 steps up and down a wall bar. On one out of two trials, while trying to demonstrate the following performance standards:

1. **Eyes** focused in direction of moving
2. **Feet** step onto alternate wall bars
3. **Hands** alternate to match feet
4. Climb up with **hands** move first and down **feet** first
5. **Hands** grip the rungs strongly

Table 7 The observation instrument for Climbing

Names	Process					Product (steps)	
	Eyes focused in direction of moving	Feet alternate	Hands match feet	Up, hands first, down, feet first	Hands grip	Target: 5 steps	
						Pre-	Post-

8. Forward Roll

Given a verbal request and a demonstration, preschoolers can accomplish forward rolling fluidly twice. On one out of two trials, while try to demonstrate the following performance standards:

1. Squat with **knees** between arms
2. **Chin** tucked onto the chest
3. **Hands** on the ground, **shoulder** width support
4. Both **legs extend** equally to push off the ground
5. Roll onto the **back of head** and shoulders
6. land on **feet** with a squat position

Table 8 the observation instrument for forward rolling

Names	Process						Product (times)	
	Knees	Chin	Hands on	Legs	Roll	Land on	Target: twice	
	between arms	tucked onto chest	ground Shoulder width	extend, push off	onto back	feet with squat position	Pre- (times)	Post- (times)

9.Hop

Given a verbal request and a demonstration, preschoolers can accomplish 8-10m hopping constantly with each foot respectively. On one out of two trials, while trying to demonstrate the following performance standards:

1. **Head** and **trunk** stable with **eyes** focused forward
2. **Support leg** bends on landing then straightens to push off
3. The **Swing leg** stays behind support leg and moves in rhythm with it
4. The supporting leg takes off and lands on the **forefoot**
5. **Arms** bend and move to assist legs action

Table 9 The observation instrument for hopping

Names	Process					Product (m)			
	Head and trunk	Support leg	Swing leg	Supporting leg takes off and lands on the	Arms	Target:			
	stable eyes forward	bends on landing, straightens to push off	stays behind, move in rhythm	forefoot	bend and move	Girl:8m Boy:10m		Pre-	Post-
								L	R
								L	R

Note: Left leg= L, Right leg = R

10. Skip

Given a verbal request and a demonstration, preschoolers can skip 8m fluidly. On one out of two trials, while try to demonstrate the following performance standards:

1. **Head** and **trunk** stable with **eyes** focused forward
2. **Legs** alternate a step-hop rhythmically
3. Land on **forefeet**
4. **Arms** move in opposition to legs

Table 10 The observation instrument for skipping

Names	Process				Product (Y/N)	
	Head and trunk stable, eyes forward	Legs alternate a step-hop rhythmically	Land on forefeet	Arms move in opposition to legs	Target: fluid	
					Pre-	Post-

Note: Y=fluid, N=not fluid

11. Gallop

Given a verbal request and a demonstration, preschoolers can gallop 8m fluidly. On one out of two trials, while trying to demonstrate the following performance standards:

1. **Head, eyes, trunk, and feet** face the direction of travel
2. **Knees** bent slightly, weight on forefeet
3. Two **feet** slide together
4. **Arms** move to assist action rhythmically

Table 11 The observation instrument for Galloping

Names	Process			Product (Y/N)	
			Feet slid together	Target: fluid	
				Pre-	Post-

	Head, eyes, trunk, and feet face forward	Knees bent slightly, weight on forefeet		Arms move to assist action rhythmically				

Note: Y=fluid, N= not fluid, L= left leg, R= right leg

12. Slide (Side gallop)

Given a verbal request and a demonstration, preschoolers can slide 8m fluidly. On one out of two trials, while trying to demonstrate the following performance standards:

1. **Head, eyes, trunk, and feet** face the front
2. **Knees** bent slightly, weight on forefeet
3. Two **feet** slide together
4. **Arms** move to assist action rhythmically

Table 12 The observation instrument for sliding

Names	Process				Product (Y/N)			
	Head, eyes, trunk, and feet face the front	Knees bent slightly, weight on forefeet	Feet slide together	Arms move to assist action rhythmically	Target: fluid			
					Pre-		Post-	

Note1: Y=fluid, N= not fluid, L= left leg, R= right leg

Note2: Slide is the same as the gallop, except it is performed in a sideward

13. Dodge

In playing a dodging game, preschoolers can perform flexible dodge action in different directions. During the process, try to demonstrate the following performance standards:

1. **Eyes** focused in direction of travel
2. **Knees** bend during the change of direction
3. **Legs** extend outward
4. **Arms** move to assist action

Table 13 The observation instrument for Dodging

Names	Process				Product (Y/N)			
	Eyes focused in direction of travel	Knees bend during change of direction	legs extend outward	Arms move to assist action	Target: flexible			
					Pre-		Post-	
					L	R	L	R

Note: Y=flexible, N= not flexible, L= left leg, R= right leg

14. Rope jump

Given a verbal request and a demonstration, preschoolers can jump rope 5 times constantly. On one out of two trials, while trying to demonstrate the following performance standards:

1. **Eyes** focus forward
2. Stand with **heels** together
3. Keep **upper arms** close to the body and swing the rope hard with **forearms** and **wrists**
4. Jump and land on the **forefeet**

Table 14 The observation instrument for rope jumping

Names	Process				Product (times)	
	Eyes focus forward	Stand with heels together	Keep upper arms close to body and swing rope with forearms and wrists	Jump and land on the forefeet	Target: 5 times	
					Pre-	Post-

Note: Y=fluid , N= not fluid , L= left leg, R= right leg

15. Bounce a ball/ hand dribble

Given a verbal request and a demonstration, preschoolers can constantly bounce a ball at least 5 times and catch it. On one out of two trials, while trying to demonstrate the following performance standards:

1. **Eyes** focus the ball
2. **Knees** bend, **legs** comfortably spaced apart
3. **Trunk** lean forward slightly
4. Use **forearm, wrist** and spread **finger-tips** to control the ball
5. Bounces the ball to **hip** height

Table 15 The observation instrument for bouncing a ball

Names	Process					Product (Y/N)			
	Eyes watch the ball	Knees bend, legs apart	Trunk lean forward slightly	Use forearm, wrist and spread finger-tips to control ball	Bounces the ball to hip height	Target: succeed			
						Pre-		Post-	
						L	R	L	R

Note: Y=succeed , N= not succeed, L= left leg, R= right leg

16. Dribble a ball / Foot dribble

Given a verbal request and a demonstration, preschoolers can constantly dribble a ball in a limited place (2.8m wide, 10m long), without losing it and without hitting the obstacles in the place. On one out of two trials, while trying to demonstrate the following performance standards:

1. Dribble with inside and outside of **feet**
2. Move the ball from one **foot** to the other fluidly
3. Lifts **head** to look around
4. **Arms** move to assist action

Table 16 The observation instrument for dribbling a ball

Names	Process				Product (Y/N)	
	Dribble with inside and outside of feet	Move ball from one foot to the other fluidly	Lifts head to look around	Arms move to assist action	Target: succeed	
					Pre-	Post-

17. Catch a ball

Given a verbal request and a demonstration, preschoolers can constantly catch a ball at least 4 out of 6 times. On one out of two trials, while trying to demonstrate the following performance standards:

1. **Eyes** focused on the ball
2. **Hands** reach out to meet the ball
3. **Fingers** soft and slightly cupped
4. Caught in **hands** only
5. **Elbows** bend after catching the ball

Table 17 The observation instrument for catching a ball

Names	Process					Product (Y/N)	
	Eyes	Hands	Fingers	Caught	Elbows bend	Target: succeed	
	focused on the ball	reach out	cupped	in hands only		Pre-	Post-

18. Pass a ball /chest pass

Given a verbal request and a demonstration, preschoolers can slightly pass a ball to a partner 2m-4m away. On one out of two trials, while try to demonstrate the following performance standards:

1. **Eyes** focused on the target in front
2. **Fingers** spread around the ball, **thumbs** behind the ball
3. Steps forward with either **foot**
4. Keeps **elbows** down
5. Follow through with arms and fingers, **palms** turned out

Table 18 The observation instrument for passing a ball

Names	Process					Product (Y/N)	
	Eyes	2.Fingers	Steps forward	Keep	Follow through	Target: succeed	
	focused on target	spread, thumbs behind	with either foot	elbows down	with arms and fingers, palms turned out	Pre-	Post-

Note: Y=succeed , N= not succeed

19. Balance on one foot (Static balance)

Given a verbal request and a demonstration, preschoolers can steadily stand with one leg for more than 40 seconds. On one out of two trials, while trying to demonstrate the following performance standards:

1. **Eyes** focused forward
2. **Head** and **trunk** stable and upright
3. **Support leg** stand still, foot flat on the ground

4. **Non-support leg** bent, not touching support leg
5. **Arms** stay still, may be extended for extra balance

Table 19 The observation instrument for passing a ball

Names	Process					Product (seconds)			
	Eyes focused forward	Head and trunk stable and upright	Support leg stand still, foot flat on ground	Non-support leg bent, no touching	Arms stay still or extend for balance	Target: 40 seconds			
						Pre-		Post-	
						L	R	L	R

20. Beam walk (dynamic balance)

Given a verbal request and a demonstration, preschoolers can walk through the beam (3m long, 10cm wide, 30cm high) in 3.7 - 4.2seconds. On one out of two trials, while trying to demonstrate the following performance standards:

1. **Eyes** look forward
2. **Head and trunk** stable and facing the front
3. **Feet** walk alternately
4. Walk with **toes** facing the front
5. Uses **arms** when necessary to maintain balance

Table 20 The observation instrument for beam walking

Names	Process					Product (seconds)			
	Eyes look forward	Head, trunk stable, facing the front	Feet walk alternately	Toes facing the front	Uses arms when necessary to maintain balance	Target: Girl:4.2 seconds Boy:3.7 seconds			
						Pre-		Post-	
						L	R	L	R