An analysis of the policy on early childhood mathematics education in China

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Abstract. Early childhood mathematics education plays an important role in pre-school education, and it has a varied role in the development of many aspects of young children's abilities and self-confidence. Research has found that the mathematical sensitivity of the early years determines to a large extent the extent to which young children will enjoy mathematics as adults. At the same time, mathematics encourages children to think about things in a hierarchical way, thus further developing their ability to think and solve problems from all dimensions. As society continues to develop and progress, and as China places more and more emphasis on early childhood education, there are many common issues that need to be addressed, and education policy is particularly important as a document that provides direction for these issues. Official policy on mathematics education and its direction will not only influence the publication of mathematics-related picture books, but also the development of kindergarten curricula, changes in teachers' teaching methods, and even the development of young children's abilities in various areas, which, if properly formulated, will lay a good foundation for the future development of young children and gradually strengthen the country's educational advantage. This paper will provide some insights into mathematics education in kindergartens, teachers and families to fill some of the academic gaps by classifying, analysing and interpreting current mathematics education policies for young children in China.

Keywords: Early childhood; Mathematics education; Policies.

1. Introduction

Mathematics education for young children is an integral part of preschool education and plays a different role in the initiation and development of quantitative correspondence, logical thinking, spatial imagination and self-confidence. In terms of its own development, modern mathematics has developed into the foundation of all-natural and social sciences, with its unique laws and values, and is, in fact, an abstraction of the real world. For young children, mathematics allows them to understand the world and gradually grasp the laws of development. At the same time, mathematics encourages children to think about things in layers, thus further developing their ability to think and solve problems at all levels [1].

Young children learn to manipulate through play, building their understanding and cognition based on playful exploration. This exploration and manipulation mediate the link between young children and abstract mathematical symbols, enabling them to continue to understand abstract mathematics from concrete reality. Abstract thinking also begins to develop at the same time [2]. Piaget, a renowned psychologist, suggested that children's thinking develops from action and that the formation and establishment of thinking depend on concrete things. There are six psychological characteristics of mathematics learning in young children: from concrete to abstract, from individual to general, from external to internal action, from assimilation to conformity, from unconscious to conscious, and from self-centred to socialisation [3].

Maria Montessori, a renowned early childhood educator, believed that young children have a sensitive period for mathematics and that it can be divided into three stages: 0-2 years, when pre-mathematical concepts are established; 3-4.5 years, when mathematics is learned; and 4.5-6 years when children's interest in mathematics is developed. At the same time, psychologists have also found through their research that the early years of mathematical sensitivity determine to a large extent the extent to which mathematics is enjoyed in adulthood.

As society continues to develop and progress and China places increasing emphasis on early childhood education, many issues of a universal nature are on the horizon and need to be addressed. Education policy is particularly important as a document that gives direction to these issues. Official policy on mathematics education and its direction will influence not only the publication of mathematics-related picture books but also the development of kindergarten curricula, changes in teachers' teaching methods, and even the development of children's abilities in all areas. If the right policies are in place, they will provide a good foundation for the future development of young children and gradually strengthen the country's education. Moreover, as mathematics is an extremely important part of education, a subject in which many children's cross-cutting abilities will be evident, research into early childhood mathematics education policies is essential. In recent years, various educational policies on early childhood have received increasing attention from researchers. In China, preschool education is divided into five main areas, namely health, language, social, science and arts. Among these, there is no separate policy on the subject of mathematics in the latest guidance issued, but rather a combination of mathematics and science, with a separate section on mathematical awareness. The current state of research at home and abroad shows that much of the public attention on mathematics education for young children at the pre-primary level has been on the content of teaching and learning as well as on teaching methods. Most domestic research has focused on the current state of preschool mathematics education in China and has made suggestions for curriculum development for teachers and kindergartens. In reviewing relevant materials, the authors found that policy research in mathematics is fragmented and that many teachers and kindergartens are unclear about what policy entails in their teaching. The policy is fundamentally a guide to the direction of teaching and learning, and it is only by understanding the changes in policy that people can build on it and innovate to keep up with the times. It is, therefore, important to study policy in mathematics education in the early years. This article fills certain academic gaps by classifying, analysing and interpreting current policies on early childhood mathematics education in China so that kindergartens, teachers and families can gain some understanding of mathematics education.

2. Analysis of Early Childhood Mathematics Education Policies

The Early Childhood Mathematics Education Policy determines the extent to which young children receive mathematical initiation at the preschool level and also influences the development and formulation of kindergarten curricula and teachers' grasp of young children's age characteristics and development. It aims to provide directional guidance as well as specific operational references and guidelines for the development of the mathematics domain for 3-6-year-olds. It reflects the need for reform in China's current educational practices and, to some extent, educational theories and ideas that have kept pace with the times and are important for improving the quality of current kindergarten mathematics education in China. At the same time, researchers need to take a global perspective, draw on experience and information horizontally, identify problems and ask questions from vertical comparisons in order to build better policies, offer advice and solve problems.

2.1 Characteristics of China's Early Childhood Mathematics Education Policy

2.1.1. Stages

For a long time before liberation, preschool mathematics education was not taught as a separate aspect of educational content but only incidentally in various activities such as language, general knowledge, music and physical education to learn some counting, recognition of Arabic numerals and simple geometric figures. After the founding of New China, preschool education was established in higher teacher training schools, and preschool education was incorporated into the national education system. At that time, the theory and practice of preschool education in China were still in the accumulation stage, and teacher training colleges at all levels were not equipped to offer courses on mathematics education for preschool children. In the early 1960s, based on the summary of China's preschool mathematics education experience, some senior teachers and kindergarten teachers offered

the Teaching Method of Calculation in Kindergarten, which was still based on the content of the former Soviet Union, and in fact, China did not have its own psychological research base. After 1978, under the policy of reform and opening up, preschool education in China, like other disciplines, entered a period of unprecedented prosperity. Chinese scholars, especially psychologists and early childhood educators, studied and drew on the advanced experiences of other countries and conducted more systematic research into children's mathematical concepts and the development of their arithmetic skills, laying a more solid theoretical foundation for the development of preschool mathematics education in China. It is necessary to make use of psychological theories and relevant research results to deeply solve the problems existing in real teaching and learning and to theoretically summarise and refine the practical experiences in preschool children's mathematics education so that they can be systematised and scientificised.

2.1.2. Developmental

Policies on mathematics education in preschool education can be traced back as far as the official public policy information of the Ministry of Education of the People's Republic of China to 2001, when the Ministry of Education promulgated The Kindergarten Education Guidelines (for Trial Implementation) (hereinafter referred to as "the Guidelines") set out the objectives and contents of mathematics education in the area of science, aiming to enable children to develop an interest in mathematics in their surroundings through life and play, such as number, quantity, shape, time and space, and to be able to experience the quantitative relationships of things, construct preliminary number concepts and learn to use simple mathematical methods to solve problems arising from them

The most recent document is the Ministry of Education's "Guidance on Promoting the Science Interface between Kindergarten and Primary School" issued in 2021.3, in which the suggested section of the Annex - "Guidance Points on Kindergarten Readiness Education" (hereinafter referred to as "Kindergarten Guidance Points") specifies the developmental objectives listing some of the ways to effectively help children Some educational approaches and methods to prepare young children for school effectively. There is more explanation of mathematics education in the Learning Readiness section, and the ways and means of mathematics education are mentioned in Developmental Goal 3, Developmental Goal 4 and Learning Ability 6, which can be broadly summarised as helping children try to use mathematical methods (counting, sorting, etc.) to solve problems in daily life through life and play, allowing children to experience the importance and fun of mathematics, and to promote the development of their multifaceted abilities.

From a few short descriptive lines to clear directions and some specific actions for mathematics education today, the policy has evolved and improved on its original basis and clarified the status and role of mathematics education in the preschool sector.

2.1.3. Timeliness and Relevance

Since 2010, there has been a serious tendency towards over-learning in the area of preschool education in China, and this is becoming more and more pronounced, especially in the area of mathematics education. Many parents have expressed a desire for their children to learn more mathematics, and many can even recognise that early learning in primary school may not be beneficial to their children's development, but the notion of "not losing at the starting line" still imprisons most parents' thinking, and many of them, therefore, put pressure on kindergartens if their children do not show skilful progress and knowledge, such as not being able to if a child does not show progress in skills and knowledge, such as not being able to recognise words or do arithmetic, it is assumed that the kindergarten is not teaching them well [4]. As a result, some kindergartens are teaching primary school content in advance, reinforcing knowledge and skills training, contrary to the laws of physical and mental development and the cognitive characteristics of young children, and there is a serious tendency towards "primary schooling" which not only deprives young children of the joy of childhood but also frustrates their interest in learning and affects their healthy physical and mental development. In response to these social conditions, the State has formulated a series of policies to alleviate the

current situation and launched National Pre-school Awareness Month, which aims to popularise the experience of early childhood development for more families and teachers.

In July 2010, the state issued the National Medium and Long-term Education Reform and Development Plan (2010-2020) and put forward the development direction of preschool education from a macro perspective, requiring the basic universalisation of preschool education in the country by 2020 [5]. In November of the same year, the State Council's "Opinions on the Current Development of Pre-school Education" proposed that kindergartens should insist on using play as the basic activity, combining teaching and learning, teaching for fun, and preventing and correcting the tendency of "primary schooling" in kindergarten education.

In June 2011, the Ministry of Education pointed out that due to the influence of exam-oriented education and some undesirable propaganda in society, the phenomenon of "primary schooling" in kindergarten education has become increasingly prominent, which has seriously interfered with the normal care and education work and damaged the physical and mental health of young children. In order to regulate the conduct of kindergartens, prevent and correct the phenomenon of "primary schooling," and ensure the healthy and happy growth of young children, the Ministry of Education issued the Notice on Regulating Kindergarten Care and Education Work to Prevent and Correct the Phenomenon of "Primary Schooling".

In the newly published Kindergarten Work Regulations in 2015, the Ministry of Education further stated that in the early childhood development stage, it is more important to help children to enhance their knowledge of the environment, cultivate useful interests and desire for knowledge, and develop initial hands-on inquiry skills.

In July 2018, the Ministry of Education also adopted the Notice on Special Treatment of "Primary Schooling" in Kindergartens, which affirms that kindergartens are strictly prohibited from teaching primary school curriculum content such as hanyu pinyin, literacy, numeracy and English in advance, and from organising day-to-day activities that are detached from children's life situations and are mainly organised in the form of concentrated classroom lessons; or from mechanical recitation, memorisation, copying and calculation. In March 2021, the Ministry of Education (MOE) promulgated a new policy on the teaching of primary school content such as Hanyu Pinyin, literacy, numeracy and English.

In March 2021, the Ministry of Education issued the "Guidelines of the Ministry of Education on vigorously promoting the scientific interface between kindergartens and primary schools", in which it is clearly stated that the situation of over-emphasis on knowledge preparation, over-standard teaching and over-learning should be changed and that the scientific interface should be done by reasonably preparing and adapting to school entry at the kindergarten and primary school levels [6].

It appears that these policies, together with corresponding publicity efforts and effective government monitoring, have so far achieved initial results.

2.2 Goals and Roles of Early Childhood Mathematics Education Policy in China

The goals of early childhood mathematics learning focus on building positive emotions for learning, stimulating interest and curiosity in inquiry, and developing basic problem-solving and thinking skills, with the basic approach to learning emphasising active construction based on perceptual experiences. As such, the content of mathematics learning for young children is coarse, life-like and actionable. At the same time, because of the stage-specific, developmental, time-sensitive and targeted nature of the early childhood mathematics education policy, the objectives of the mathematics education policy are to:

2.2.1. Help Young Children Gain Scientific Enlightenment in Mathematics According to the Laws of Their Physical and Mental Development

Early childhood mathematics education is not simply a one-way transfer of knowledge, nor is learning mathematics passively accepted and remembered, but it is an active construction based on children's perceptual experience of their surroundings. Young children are prompted to think through practical manipulation and exploration, to interact with concrete situations in their lives and to

construct, to use their existing experiences to discuss and communicate, to solve practical problems collaboratively, and to use mathematical thinking to ask questions and to fulfil the role of mathematics as an instrumental subject. Early childhood mathematics learning is an active construction based on the perceptual experience of the surrounding environment and is a form of interactive learning that is lived and contextualised, where children experience mathematics in context and gain direct experience of mathematics rather than being taught in a traditional classroom setting. Although some of the content dimensions are similar to those of the early years of primary school, they have completely different objectives. "What is valued is the process and experience of learning mathematics. This type of learning emphasises the accumulation of experience rather than the acquisition of mathematical knowledge. Policies are therefore required to achieve completeness and clarity in order to help young children gain mathematical enlightenment and experience more quickly and better.

2.2.2. Help Teachers Grasp the Laws of Physical and Mental Development in the Area of Early Childhood Mathematics Education

The first is to help Teachers to grasp the basic goals of mathematics learning for young children. As stated in the Basic Requirements for Mathematics Education in Kindergarten, teachers should guide young children to develop an interest in the phenomena of number, quantity, shape, time and space in their surroundings through life and play, to feel the quantitative relationships of things and to experience the importance and fun of mathematics.

A central theme of mathematics learning in the early years is to guide children to develop positive emotions and attitudes towards learning and to stimulate their interest and curiosity in inquiry. Through the initiation of mathematics in early childhood, children are made to feel that mathematics is everywhere and part of the world they live in. This is the only way to create a real interest in learning and to mobilise positive emotions in young children, who are then willing to investigate and study. It is clear that 'feeling', 'experience' and 'interest' are the core elements of mathematical learning for young children, not mathematical knowledge, and that superficial mathematical knowledge is only a way for young children to gain "Rough mathematical knowledge is only a content vehicle for children to gain 'feelings', 'experiences' and 'interests'.

Then is to help teachers understand the basic ways in which young children learn mathematics. The Essentials of Kindergarten Guidance sets out four areas of physical and mental, life, social and learning readiness, and the Education Recommendations section specifies the value of developmental goals and lists some educational approaches and methods that are effective in helping young children to prepare for school. Teachers need to develop a scientific understanding of the basic ways in which young children learn mathematics and to understand the basic characteristics of mathematics learning for young children in ways that are appropriate for their healthy development [7]. It is important to recognise that in mathematics learning for young children, mathematics education must be closely integrated with real life so that children can use familiar things and experiences as a starting point for their thinking, feel that there is mathematics everywhere in their lives, that there are mathematical elements in everything and in every aspect of life, and that they can find, ask and solve practical problems from them so that mathematics becomes a tool for young children to exercise and grow in their own minds.

It is also important to help teachers to clarify the content points of mathematics learning in the early years. The Guidelines on Learning and Development for Children Aged 3-6 promulgated in 2012 also integrate mathematics and science, but with a separate section on mathematical cognition, through three goals: Goal 1 Initial perception of the usefulness and interestingness of mathematics in life; Goal 2 Perception and understanding of number, quantity and quantitative relationships; Goal 3 Perception of shape and spatial relationships and three age groups 3-4 years; 4-5 years; and 5-6 years, which means The content of mathematics education at the Early Childhood Education level is elaborated in detail.

The last is to help teachers understand individual differences in young children's learning of mathematics. Due to differences in personal experiences and life circumstances, gaps in individual

talents and pre-learning foundations, and differences in individual learning cognitive characteristics, there are individual differences in each child's learning of mathematics, which requires teachers to treat children with different learning characteristics differently in the educational process.

China's policy on individual differences in early childhood has always been in place, as evidenced by the Kindergarten Work Regulations issued in 1996, which states that "we should follow the laws of physical and mental development of young children, conform to their age characteristics, pay attention to individual differences, teach according to each child, and guide the healthy development of their personality"[8]. However, as the concept of individual differences is very specific, there are no more detailed prompts, and teachers rely more on case studies in books and experience in their work. This also requires extra attention from teachers to avoid complacency as a result of quick mastery. At the same time, mathematical knowledge is abstract and logical, and children have difficulty in understanding it because of their level of thinking, which requires a process. During this process, teachers should not be overly demanding but should pay attention to each child's progress, grasp each child's nearest developmental zone as far as possible, and develop further learning guidance based on this. Teachers should pay attention to the differences between individual children and adopt different approaches to guide children's learning and understanding.

2.2.3. Help Parents Understand the Developmental Characteristics of the Field of Early Childhood Mathematics Education and Accelerate the Pace of Home-School Cooperation

For the promotion of parents, China began to carry out the activities of the National Pre-school Education Publicity Month in April 2013, as mentioned in the 2013.4 "Notice of the General Office of the Ministry of Education on the Activities of the 2013 National Pre-school Education Publicity Month"[9]. For the development of scientific parenting services, kindergartens need to make certain efforts in the promotion of the Guidelines, and carry out various forms of activities in the community on the Guidelines Parents are encouraged to learn how to use the right methods to encourage and support their children, and to gain a more comprehensive understanding of the physical and mental development of their children. Many parents, after studying and understanding the concepts, have given feedback that they will try to respect their children's opinions and not put too much pressure on them so that they can grow up freely and happily.

2.2.4. Help Kindergartens Position Mathematics Education Accurately and Clearly in the Kindergarten Curriculum

Mathematics education in kindergartens was introduced in the 1980s as a separate area, such as numeracy. In the 21st century, with the development of early childhood education, education has become increasingly focused on the development and improvement of children's abilities in many areas. In order to avoid the problem of primary schooling in early childhood education and to promote the healthy development of children, the new curriculum has placed mathematics within the scope of science, which does not mean that mathematics education can no longer be taught, but that the focus has shifted from the mastery of mathematical knowledge to the cultivation of children's interest in mathematics and the development of initial problem-solving skills—moreover, the ability to solve initial mathematical problems. Mathematics education in kindergartens should create a mathematical manipulative activity and a constructive environment for children to use mathematics in real problem situations to solve real problems and to promote their mathematical thinking skills and problem-solving abilities. Such an environment can be either a specially designed mathematical activity by the teacher or a variety of factors from the children's surroundings in their daily lives, allowing them to explore and learn mathematics in rich, meaningful manipulatives that help them to develop in the mathematical domain.

2.3 The Content of Chinese Early Childhood Mathematics Education Policies

In the kindergarten curriculum from the late Qing Dynasty to the Republic of China, mathematics education for young children "was only incidental to the learning of some counting, recognition of Arabic numerals and simple geometric figures in various activities such as language, general

knowledge, music and physical education." [10]. Yang Dongping divides the development of China's early childhood mathematics education curriculum into four periods.

The first period refers to kindergarten mathematics education during the period of national economic recovery and socialist transformation. The second is kindergarten mathematics education during the period of comprehensive socialist construction when a boom in the teaching of calculation was set off throughout the country. The third is kindergarten mathematics education during the Cultural Revolution when kindergarten mathematics education was at a standstill. The fourth is kindergarten mathematics education during the period of building socialism with Chinese characteristics, when the official documents in the field of preschool mathematics education, namely the Outline and the Guidelines, are currently mentioned in more detail in China. The Outline classifies early childhood mathematics education as something like a science domain and no longer divides it into separate domains, and the Guide to Learning and Development for Children Aged 3-6, promulgated in 2012, also integrates mathematics with science but has a separate section on mathematical cognition, detailing the content of mathematics education at the early childhood education level through three goals and three age groups.

2.4 Relationship between Mathematics Education Policy and Education Policy in Other Domains

According to the laws of early childhood physical and mental development, the early childhood stage of development is holistic and stage-specific and cannot be separated independently. Therefore, preschool education in China is divided into five major areas, namely health, language, social, science and art, and the five major areas are integrated and included in each other, cross-pollinated and integrated into the young children's day-to-day life, while mathematics is included in the science area in the latest policy document of the Guidelines Mathematics education policy does not exist as a separate subject model. The following analysis will focus on the Guidelines for the Learning and Development of Children aged 3-6 years [11].

2.4.1. Relationship with Science Education Policy

The Guidelines for the Learning and Development of Children Aged 3-6 integrate mathematics and science and state that science learning for young children is a process of trying to discover the similarities, differences and connections between things as they explore concrete things and solve real-life problems. In the process of trying to use mathematical methods (categorisation, ordering, judgement, reasoning) to solve real-life problems, children not only gain rich perceptual experience and develop imaginative thinking but also gradually develop logical thinking skills, laying the foundation for further learning in other areas

Science and mathematics always appear in a mutually encompassing state, such as science experiments, which help children learn scientific theories from experimental facts, improve their thinking skills and develop their sense of experimentation in the process of playing, and have an irreplaceable role in improving their hands-on skills and non-intellectual factors. At the same time, doing experiments can encourage children to use their hands and brains actively, learn to think freely, be brave enough to make conjectures and question questions, and develop their creative spirit. In the process of inquiry, learning is not only to learn knowledge but also to master scientific problem-solving methods and to experience the process of scientific inquiry. This will maximise children's motivation to learn and allow them to take the initiative to experience and learn. Different statistical and classification methods will be used in the process of processing the data. Children will be able to understand more intuitively the statistics and concepts of numbers and feel the relationship between numbers and quantities.

2.4.2. Relationship to the Health Education Policy

Health education is ubiquitous in kindergarten day, such as children's eating, sleeping, washing and excreting, as well as outdoor games and physical activities, which are the area’s most closely linked to children. The mathematics education policy proposes to encourage and support children to

discover and try to solve problems that require the use of mathematics in their daily lives and to experience the usefulness of mathematics. For example, the Guidelines suggest that mathematics education in health can be expressed in the following ways: by counting and measuring with children to determine order and ranking during physical activities such as ball-slapping, rope skipping, long jumping or sandbag throwing. In the process, it is not only possible to organise lively, interesting and varied physical activities in conjunction with mathematics, to develop children's interest in physical activities and to attract their active participation, but also to foster the development of children's ability to use mathematical methods to solve problems and to experience the importance and pleasure of mathematics in the process.

2.4.3. Relationship to Language Education Policy

The key to developing children's language is to create an environment in which they want to speak, dare to speak, enjoy speaking, have the opportunity to speak and receive positive responses. The Framework states that language education needs to extend children's experiences and provide the conditions for language development through a variety of activities that interpenetrate all areas of education. The language education policy is one of the most interpenetrating aspects of the Guidelines, for example, learning to use appropriate vocabulary to describe the size, number, height, thickness and other quantitative features of common things and to use orientation words such as up and down, front and back, inside and outside, in the middle and beside to describe the position and direction of movement of objects. Children use language to gain a deeper understanding of mathematical methods in the contexts created, to perceive the existence of mathematics in their lives, to develop problem-solving skills while learning to use specialised nouns, to enrich their vocabulary, to learn to express, communicate and share the process and results of their explorations in a variety of ways, and to enhance their language expression skills.

2.4.4. Relationship with Social Education Policy

The Framework states that education in the social domain is subtle in nature. Young children learn socially through living, interacting, exploring and playing together with adults and peers. Its integration with mathematics education can create a good environment where young children can feel accepted, cared for and supported, e.g., when discussing where to go on a spring trip, let children discuss where they would like to go. How many people are there in each place they want to go? Make decisions based on the statistics; when sliding down the slides, line up in an orderly manner according to the 'first come, first served' rule. Provide children with opportunities and conditions for interpersonal interaction and joint activities, guide them to participate in group activities, solve problems through mathematical means, develop their awareness and ability to learn cooperatively, and learn initial interpersonal skills.

2.4.5. Relationship with the Arts Education Policy

The Arts Education Policy emphasises the importance of children using different art forms to express their emotions, understanding and imagination boldly and to feel the joy of creation. In the process of integrating with Mathematics Education, teachers use things and phenomena around them as objects for scientific exploration by helping children to relate to real life. For example, the Guidelines state that children can be encouraged and supported to use blocks, cardboard boxes, puzzle boards and other shaped materials for building games or making activities. For example, a rectangular cardboard box with two round bottle caps can be used to make a 'car'; in music and dance activities, children are guided to feel the direction of spatial orientation and movement. The development of spatial imagination and the ability to explore in a variety of senses and ways is infused with the joy of free expression and creativity.

3. Problems with the Current Policy on Early Childhood Mathematics Education in China

The Early Childhood Mathematics Education Policy is a programmatic document promulgated by the state as the basic norms and requirements of the state for the field of mathematics education, reflecting the basic requirements of the state in terms of knowledge and skills, processes and methods, and emotional attitudes and values for children of different ages in the field of mathematics. However, the current mathematics education policy in China faces different problems and challenges in terms of formulation, implementation and execution.

3.1 Policy Formulation

With the small span of policymakers, decision-making is difficult. A general analysis of a series of documents and circulars issued by the Ministry of Education of the People's Republic of China shows that the current formulation of relevant education policies in China is mainly focused on experts and scholars in the field of preschool education and there is a lack of educators at the grassroots level who have difficulty in understanding the current situation and difficulties faced by grassroots mathematics education. Moreover, due to the large population base in China and the large research workload, most policymakers lack research and understanding of the current situation of mathematics education at the grassroots level. At the same time, the complexity and diversity that exists between China's ethnic regions has led to the need for policy development to be more adaptable and universally applicable to each region or level of kindergarten, making it difficult to serve kindergartens of different socio-economic conditions and different cultural backgrounds.

3.2 Implementation of the Policy

The implementation of the policy is weak, with less support from relevant curriculum resources and a lack of clarity in the understanding and grasp of the policy by personnel at all levels. After the policy was promulgated, it was distributed by the Ministry of Education to all provincial and municipal education authorities across the country, which then interpreted the curriculum guidance document according to the actual situation of kindergartens and young children in their regions, and then distributed by the education authorities to kindergartens, which formulated their own educational development plans accordingly. Although the Ministry of Education has relevant publicity activities, such as the National Pre-school Education Publicity Month, there is still a lack of developmental experts to explain the overall objectives and specific content of the policy, resulting in some kindergartens with uneven capacity development having difficulties in developing their mathematics curriculum and continuing to use the old curriculum, unable to achieve simultaneous reform, while some new inexperienced teachers do not have a systematic concept of exactly what early childhood mathematics education what level should be mastered at what stage. At the same time, the lack of parental knowledge and understanding of early childhood mathematics development and the fact that some parents are still stuck with closed, outdated conceptual information has led to inconsistencies between parents' views and teachers' recommendations, which has created considerable resistance to the implementation of the kindergarten mathematics education curriculum and the development of young children's mathematical skills, as well as hindering parental co-education.

Educational resources also vary across regions, levels, urban and rural, eastern and western, coastal and inland, and model kindergartens and ordinary kindergartens. The tendency and variability of some resources, such as teacher training and public demonstration lessons in the area of mathematics education, also allow kindergartens, teachers and parents in different regions to understand the policy to different degrees.

3.3 Implementation of the Policy

The practicality of policy implementation is more limited, and it is difficult to implement the policy. As policies need to be made more adaptable and required to be universally applicable to every region

or level of kindergarten, in the case of the Mathematics domain curriculum, from a separate domain to being classified as a science domain, the Outline also contains a simple reference to the content of mathematics education and the issues that should be noted. However, in the face of such simple objectives, the implementation process has greatly increased the demands on the competence of early childhood teachers in terms of specialist teaching skills and theoretical knowledge in mathematics. Some kindergarten principals and teachers generally report that the Guidelines for Kindergarten Education (for Trial Implementation) have reduced the requirements for specific knowledge and skills in mathematics compared to previous education guidelines and have placed more emphasis on the development of children in a variety of ways and in a free manner. Although the aims of mathematics education are clearly stated in the Guidelines, and certain recommendations for its implementation are given, they are still very limited in scope, targeting a large number of children of different ages. At the same time, due to China's huge population, the number of kindergartens does not match the number of children enrolled in them, and many kindergartens have class sizes that far exceed the numbers recommended in the policy, resulting in teachers being unable to meet requirements such as respecting individual differences when faced with numbers of children beyond their capacity.

4. Conclusion

Mathematics education for young children is an integral part of preschool education, and it plays a role in the initiation and development of young children's ability to correspond quantitatively, think logically, imagine spatially and develop their self-confidence to varying degrees. It also influences the development and formulation of kindergarten curricula and teachers' grasp of children's age-related characteristics and development. It aims to provide directional guidance and specific operational references and guidelines for the development of mathematics for 3-6-year-olds, reflecting both the needs of China's current educational reform and, to a certain extent, the need to It reflects the need for reform in China's current educational practice, and to a certain extent, educational theories and ideas that have kept pace with the times, which is of great significance in improving the quality of current kindergarten mathematics education in China.

By summarizing, analyzing and concluding the policies promulgated by the Ministry of Education of the People's Republic of China from 1996 to 2022, the author finds that current Chinese mathematics education policies are characterised by stage, development, timeliness and relevance, with different goals and roles for the four main subjects of children, teachers, parents and kindergartens, and at the same time, according to the laws of physical and mental development of young children, the overall and stage of development of young children The policy on mathematics education does not exist as a separate discipline, but is included in the science domain in the newly promulgated policy document, and is integrated with the five major domains in the day-to-day life of young children at the same time. Given China's large population base and the complexity and diversity that exists between ethnic regions, leading to the need for policy development to be more adaptable and universally applicable to every region or level of kindergarten, China's current mathematics education policy faces different issues and challenges in its development, implementation and enforcement.

References

[1] Ma Huiyan (Yantai Early Childhood Teacher's College, Yantai 265600, Shandong), Research on the reform and innovative measures of mathematics teaching in preschool education, 2021.

[2] Pan Yuejuan, Reflections on the current kindergarten mathematics education policy in China , 2005.03.003

[3] Huang Jin, Kindergarten mathematics education and activity design. Beijing: Higher Education Press, 2010.

[4] Mou Xiaofeng, A study on the current situation of kindergarten mathematics education curriculum implementation. 1994-2022 China Academic Journal Electronic Publishing House, 2012.

[5] Li Zijian, Huang Xianhua, Curriculum: paradigms, orientations and design. Hong Kong: Chinese University of Hong Kong Press, 1996, p. 322.

[6] Ministry of Education, 2021-03-31, Guidance from the Ministry of Education on vigorously promoting the articulation of science between kindergarten and primary school, 2021, No. 4.

[7] Tian Fang (Department of Education, East China Normal University, Shanghai, 200062), Characteristics Analysis and Educational Suggestions of Preschool Children's Core Experiences in Mathematics Learning and Development, 2019, [Vol. 10, 2019 (No. 814) Early Childhood Education (Educational Sciences) No.10, 2019 General No.814].

[8] State Education Commission, Regulations for Kindergarten Work, State Education Commission Order No. 25. 1996-03-09.

[9] General Office of the Ministry of Education, Notice of the General Office of the Ministry of Education on the 2013 National Pre-school Education Publicity Month, Letter of the Second Office of Education Foundation [2013] No. 8. 2013-04-03.

[10] Lin, Yonghai, The emergence of mathematics and the development of the discipline of preschool mathematics education in China. Shandong Education (Early Childhood Education Edition), 2000.

[11] Ministry of Education of the People's Republic of China, Ministry of Education Notice on the Issuance of the Guide to Learning and Development for Children Aged, 2012-10-09.