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Scenario based Safety-education Stage PlayA+CCDRRfor Primary and Middle School Students in China and its Application

Zhang Jack and Xu Jia

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Research and Application of the Tool of Risk Assessment and Preparedness Improvement Based on Safety Education Scenario Stage Play

Jack Zhang: Chairman of Beijing Dorapower Technologies Co., Ltd,
President of Z-park Industry Alliance of Emergency Management
Xu Jia:VP of Beijing Dorapower Company, Deputy Secretary General of Z-park Industry Alliance of Emergency Management

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Abstract: The paper is from the latest results of the Project "Future Schools" initiated by the Ministry of Education (MOE), P.R.China. Combining with the actual situations of school safety of Chinese primary and middle schools, the innovative tool of "School Risk Assessment and Preparedness Improvement based on safety education scenario stage play (SRAPI)"is established by referring to the international framework "Comprehensive School Safety (CSS)"which is jointly developed by UNISDR, UNDP, STC etc., and other international children safety education standards (e.g. DRR Key Messages), with following over 100 related safety laws and regulations of China. The applications of this tool show that it can thoroughly evaluate school risk in both qualitative and quantitative levels. SRAPI provides as a theoretical tool for education management departments and schools in school risk assessment, as well as, provides as a practical method of "edutainment" in the improvement of emergency power for students and teachers.

Key words: Comprehensive School Safety (CSS); safety education of students in primary and middle schools; scenario stage play; risk assessment; the improvement of emergency power

1. Introduction

According to the report of World Health Organization, accidental injury is the first reason for child deaths under 14-year-old over the world. In each 30 seconds, a child dies in the world, which makes the reduction of accidental child death a worldwide problem. American official statistical data show that almost 9,000 children die for accidental injury per year and some children are left permanent disability. In China, accidental child death

accounts for 26.1% of child deaths and the mortality of accidental child injury under 14 years old is twice than American. In recent years, the injury of Chinese students in middle and primary schools caused by lacking of the consciousness of safety protection are increasing in which accidental injury becomes the primary reason that threatens children' security. Report of Basic Research of Disaster Reduction Education Condition in Middle and Primary School of China released by CFPA in May 2017 shows that each year about 16,000 children die unnaturally across the country and each day around 40 children die unnaturally in average. In the activity of "China Juvenile and Children Safety Action" that organized by Central Committee of the Communist Youth, Ministry of Education, Ministry of Public Security and etc, Organization Committee conducted the survey about the safety problem of students in middle and primary school in ten provinces and cities such as Beijing, Shanghai, Guangdong, Shanxi and etc. The results show that school is the place the parents mostly worry children getting hurt, which takes up 51.44%. And others respectively are public place accounting for 36.32 %, natural environment accounting for 10.44% and home accounting for 1.8%.

Dorapower is Film, the Project "Future Schools" initiated by the Ministry of Education (MOE), P.R.China. Cooperating with National Emergency Management Expert Group, Beijing Normal University, Emerging Risk Research Institute of NCUT and etc. we further analyzed the results of survey and landed the international children safety education standard "2017 Comprehensive School Safety (CSS)" that jointly developed by UNISDR, UNDP, STC and etc. in China. Moreover, combining the related laws and regulations and the actual situations of school safety in Chinese middle and primary school, we proposed the methods that "scientizing school risk assessment" and "improving emergency power in entertainment" in which formed the Tool of Risk Assessment and Preparedness Improvement Based on Safety Education Scenario Stage Play.

2. Current situation of school risk assessment and preparedness improvement at home and abroad

In Mar.2015, the Third World Conference on Disaster Reduction of United Nations held in Sendai, Japan and passed 2015-2030 Sendai Framework of Disaster Reduction with the agreement of representatives from 187 countries in the world, which set 7 goals and 4 priority actions. UNDP, UNISDR, STC and etc. formulated some general safety education standards, such as DRRKey Messages, CSS and so on in which the risk assessment indexes aiming at various disaster-causing factors proposed in CSS provide the basis for schools to

make comprehensive safety plan. In the latest version of CSS, the school safety assessment system includes 3 overall indexes, which are “safe learning facilities”, “school disaster management” and “disaster reduction and resilience education”, and 39 items. These indexes completely match and fully practice the 2015-2030 Sendai Framework of Disaster Reduction. They are also examined and promoting in countries and regions of America, China, Japan, Indonesia, Central America and etc.

It’s worthy to learn the advanced and ripe experiences from some developed countries like America and countries in Europe. In America, the school districts formulate the index of social risks assessment in school education, which are optimal standard and related index of school district safety. The American school district safety standard includes 7 first-class indexes, 29 second-class indexes and correspondent third-class indexes. And there are also related laws and implementing regulations under each index. For example, conduct annual security check to all educational organizations and auxiliary facilities to ensure them conform to the regulations, all weaknesses shall be fixed within reasonable time.

The existing risk researches in China mainly are the risk source identification and assessment in natural disaster and industrial production, comparing to the safety risk in middle and primary school. And the research contents concentrate on the single factor risk assessment theory and standardization method in earthquake, fire disaster, assembly occupancies, violent and terrorist precaution, public health and etc, which are insufficient to analyze the risk in school emergencies in the overall aspect. Furthermore, there are many deficiencies in the improvement of school emergency power like short of pertinence in contents, lack of systematic instrumental design, single form of teaching, infusing knowledge of disaster prevention, ignoring the participation and experience of students and teachers and so on. Therefore, it’s urgent to formulate a comprehensive system of risk source identification and assessment.

From the above, referring to the advanced risk assessment system of Comprehensive School Safety(CSS), consider the situations of middle and primary schools in China and develop a scientific tool for school safety risk assessment and preparedness improvement, which improve teachers’ and students’ consciousness of school safety and emergency power meanwhile help education management departments enhance the scientization, systematization and normalization of school safety management, promoting the construction of safety school.

3. Design and application of the tool of school risk assessment and preparedness improvement based on safety education scenario play

The design of this tool refers to the international framework of Comprehensive School Safety(CSS) and takes the features of Chinese school safety into consideration. To 4 board categories, 41 subgroups and 4000 disaster types, the indexes of school risk assessment include 3 first-class indexes, which are “safe learning facilities”, “school disaster management” and “disaster reduction and resilience education”, 9 second-class indexes and correspondent over 600 third-class indexes. Moreover, the formed “school disaster risk assessment and management model” constitutes “school infrastructure risk assessment tool”, “school disaster reduction management assessment model” and “school disaster reduction and resilience education assessment and preparedness improvement”, which will motivate the assessment and improvement of comprehensive school safety. The confirmation of detailed indexes and the construction of models provide theoretical basis and practical guidance for disaster prevention in risk management, school management system and the safety behavior of teachers and students.

The comprehensive school safety assessment will collect data according to the three-class indexes and then calculate the collected data by the “school disaster risk assessment and management model” basing on analytic hierarchy process and Bowtie model. Integrating qualitative analysis and quantitative calculation, the model determines the relative weights of each index and calculates the probability and influence of risk incidence. Then, rank possible disasters by the value of risk and determine the priority of possible risk incidents, laying foundation for further risk management. After that, analyze the possible incidents and causes according to the priority of disasters, especially the vulnerable spot of risk control and organization. Finally, combine with the historical data to distinguish threat classifications and mistakes in which figure out the critical information corresponding to each disaster. From the risk management, school management system and the safety behavior of teachers and students, the model provides theoretical basis and practical guidance for disaster prevention and loss.

The tool will automatically choose the scenario play and courses of safety education with integrated the critical information after acquired the priority and critical information of disaster by automatic assessment. In terms of Advice about Enhancing the Construction of Safety Risk Prevention and Control System in Kindergarten, Primary School and

Middle School and Guidance Outline of Public Safety Education of Primary and Middle School issued by General Office of the State Council, the safety education courses based on scenario play aim to teach students knowledge of disaster reduction and resilience due to different classes and promote the school safety by the innovative safety education model, “emergency culture + safety education + personal involvement”.

The practical applications of the tool of school risk assessment and prepared improvement based on safety education scenario play are shown as follow:

1) Develop scenario in terms of the basic information of school, design Risk Assessment Questionnaire basing on the three-class indexes of school risk assessment, collect data from teachers, students and parents of students about the CSS school safety and emergency management.

2) To the collected data, the tool will automatically calculate the priority of disasters and obtain critical information of disasters by the school risk assessment and management model.

3) The tool chooses safety scenario plays (include professional assessment knowledge) on the basis of priority and integrates the corresponding critical information of disasters into the safety education courses based on scenario play (combine professional textbook and course).

4) Choose teachers and students to perform the safety scenario play and teach students with safety knowledge basing on the safety scenario play.

5) After teaching, reconstruct new scenario in line with the contents of teaching and test teachers and students with the new scenario, and then form the *Report of School Emergency Power Improvement Data Distribution.*

6) According to the Report of School Emergency Power Improvement *Data Distribution*, the tool will give *School Risk Assessment Report*, *Course Planning Consulting Report of School Safety Education*, *Report of School Disaster Reduction and Resilience Education Assessment and Preparedness Improvement and etc.*

Our company is applying for the national patent of invention for the key technologies used in the tool of school risk assessment and preparedness improvement based on safety education scenario play. With the improvement and application, it will become a strategic method to help education management departments and school construct safety school and develop safety education.

4 Introduction of classic cases

4.1 Research case - “Affiliated school of North China University of technology” in Shijingshan District, Beijing:

In Nov.2017, the tool of school risk assessment and preparedness improvement based on safety education scenario play was applied to the secondary section and primary section of affiliated school of North China University of Technology. The project team launches the activities of risk identification and preparedness improvement about natural disaster, accident, public health emergency and social security incidents, as well as, the teaching courses of safety education scenario play. The project team collected the data of safety risk assessment by designed scenario and then conducted the drill of safety education scenario play and related courses basing the analytical results of risk assessment, which also explained and operated the concrete knowledge points. After finished the performance of safety education scenario play and safety courses, teachers and students accepted the assessment test basing on new scenario, which tested the effect of teaching. Through this practical application, the affiliated school of North China University of Technology defined the priority of possible disaster and realized the emergency preparedness of school in qualitative. In addition, the school checked and improved the coping capacity to fire disaster and abduction by chose 10 teachers and students (31 students) from the third year of primary school to the first year in middle school in which accumulating the experience of school disaster reduction and resilience education to students in different grades.

UNISDR
The United Nations Office for Disaster Risk Reduction

Referring to the CSS standard of United Nations, pretesting safety risk assessment by designed scenario

Teachers and students from affiliated primary school of NCUT performed the safety education scenario play

Students from affiliated middle school of NCUT are on the class of safety education scenario play

Table 1: Statistical data and distribution of pretesting emergency power

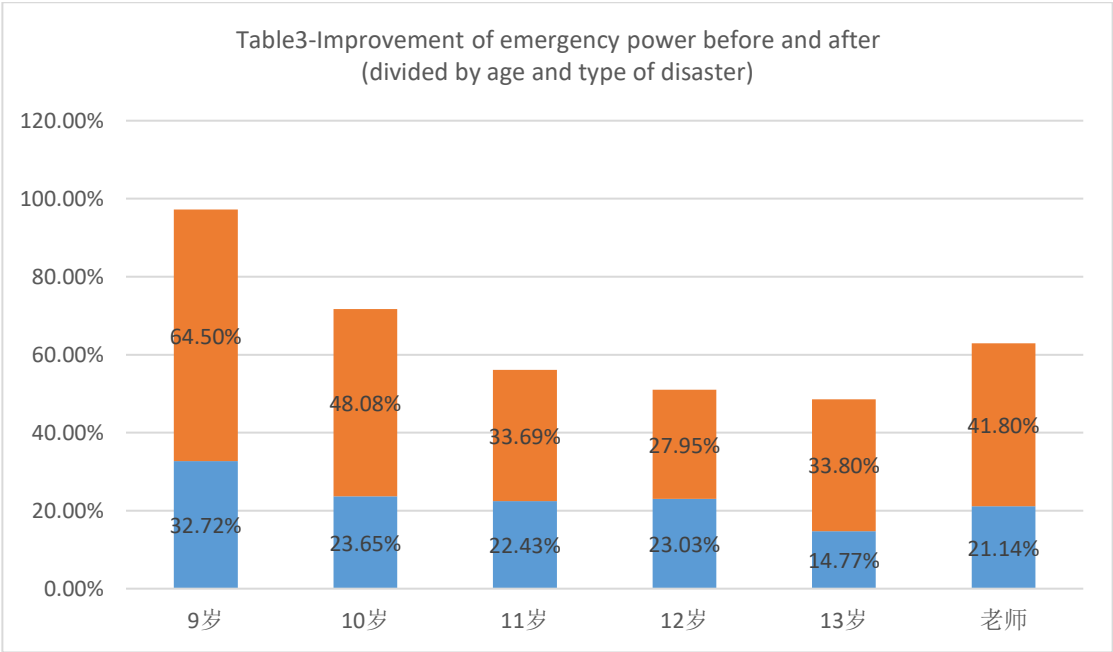
(Fire handing ability, anti-abduction ability)

Score (Full score-100)	Students		Teachers	
	Fire related number of people	Anti-abduction number of people	Fire related number of people	Anti-abduction number of people
0-59	0	5	1	2
60-69	1	13	3	5
70-79	17	11	4	1
80-89	10	0	1	1
90-99	2	2	1	1
100	1	0	0	0
Total:	**31**	**31**	**10**	**10**
Average score:	**74.58**	**64.77**	**72.46**	**62.58**

Table 2: Statistical data and distribution of pretesting emergency power after applied the tool

(Fire handing ability, anti-abduction ability)

Score (Full score-100)	Students		Teachers	
	Fire related number of people	Anti-abduction number of people	Fire related number of people	Anti-abduction number of people
0-59	0	0	0	0
60-69	2	2	1	1
70-79	3	1	2	2
80-89	16	21	4	3
90-99	6	6	2	4
100	4	1	1	0
Total:	**31**	**31**	**10**	**10**
Average score:	**91.62**	**90.89**	**87.78**	**88.74**



4.2 Research case "Beijing Second Experiment Primary School" in Xicheng District, Beijing:

In Jan.2018, the project team applied the tool to the Desheng School of Beijing Second Experiment Primary School by risk interview and assessment test, teaching based on safety education scenario play, scenario design of knowledge points, performance of scenario play and etc. Moreover, conduct risk assessment and safety courses to 90 students and 9 parents of students.

Taking the incident risks in winter holiday as topic and coping fire and abduction as main line, teachers and students participated in and performed three scenario plays about safety education. After the performance of each play, experts interacted with students, analyzed and commented on the safety scenario plays. The collected data and analytic results are as follow:

Table 1: Data collection of CSS school safety and emergency management (include 3 board categories: learning facilities, disaster management, risk reduction and resilience education)

Score (Full score-100)	Students	Parents	Total number of people	Total score of students	Total score of parents
0~59	13	3	16	580	140
60-69	8	2	10	480	120
70-79	39	0	39	2815	0
80-89	18	4	22	1440	320
90-99	9	0	9	810	0
100	3	0	3	300	0
Total:	**90**	**9**	**99**	**6425**	**580**
Average score:				**71.39**	**65.74**

Table 2: Statistical data and distribution of daily emergency management (Fire handing ability, anti-abduction ability)

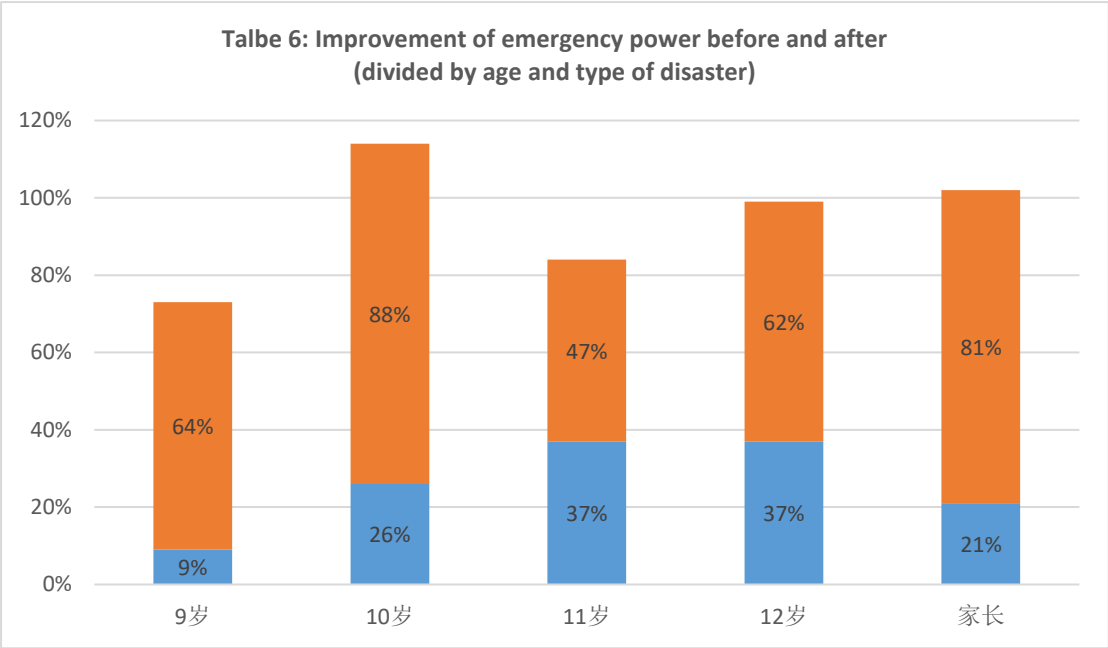
Score (Full score-100)	Students		Parents	
	Fire related number of people	Abduction related number of people	Fire related number of people	Abduction related number of people
0-59	40	90	4	8
60-69	20	0	3	0

70-79	17	0	1	0
80-89	10	0	1	1
90-99	2	0	0	0
100	1	0	0	0
Total:	**90**	**90**	**9**	**9**
Average score:	**67.44**	**54.04**	**64.44**	**48.15**

Table 3: Improvement and data distribution of emergency power after applied the tool (Fire handing ability, anti-abduction ability)

Score (Full score-100)	Students		Parents	
	Fire related number of people	Abduction related number of people	Fire related number of people	Abduction related number of people
0-59	2	0	0	1
60-69	1	2	1	0
70-79	13	10	2	2
80-89	40	71	1	2
90-99	4	6	4	4
100	30	1	1	0
Total:	**90**	**90**	**9**	**9**
Average score:	**83.89**	**89.26**	**77.78**	**87.04**

The project team designed new scenario to retest the emergency power of teachers, students and parents of students. Through longitudinal tracking and monitoring, the emergency power of students, teachers and parents greatly improves 20 % ～ 40 %.



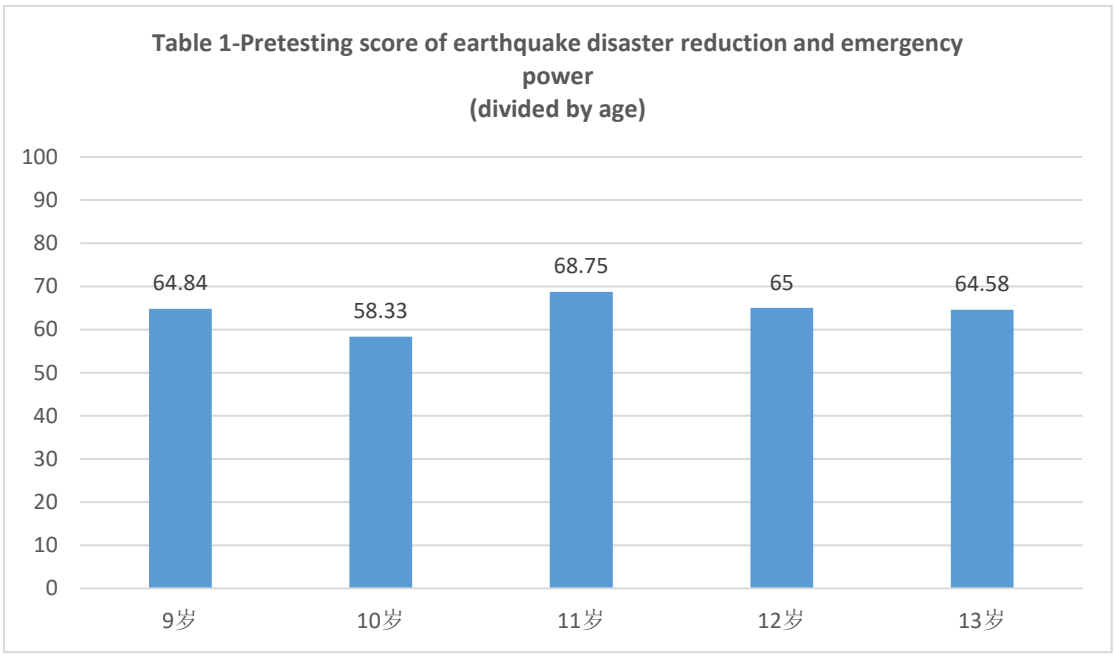
Percent of improvement in Fire handing ability Percent of improvement in anti-abduction ability

4.3 Research case of "National seismic emergent succor training center" safety education training activity

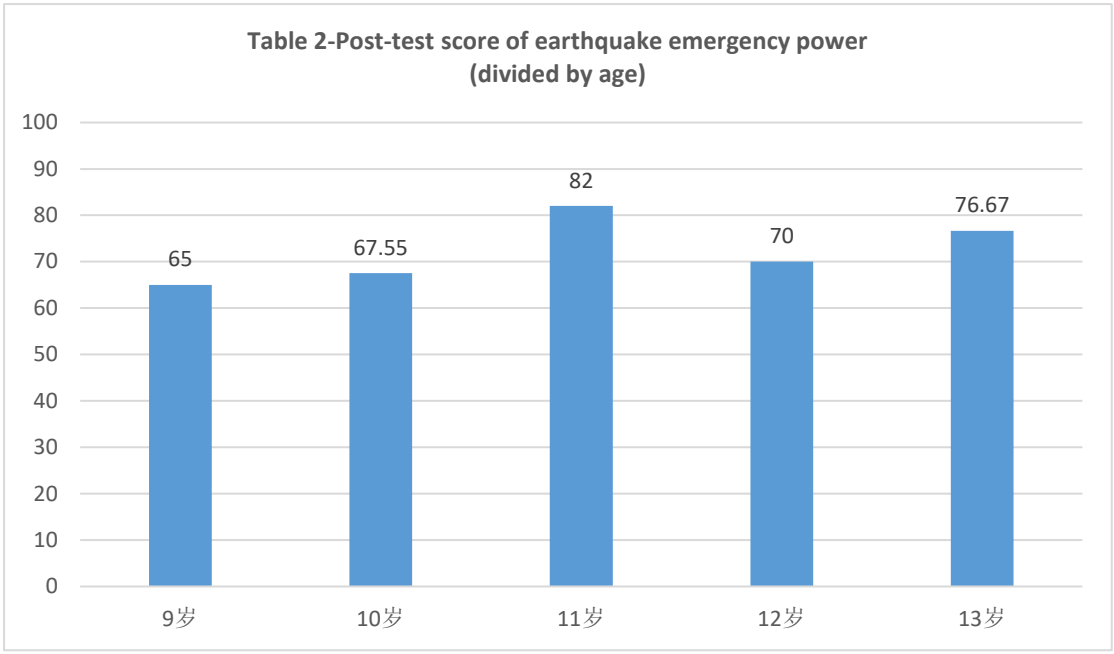
On May.5th, 2018, 35 Young Pioneers came to the National-level Safety Education Training Base for Primary and Middle School Students, "National seismic emergent succor training center". They participated in an interesting earthquake escaping class and taken the pretest and post-test of "Risk Assessment and Preparedness Improvement Questionnaire of Middle and Primary School Based on Safety Education Scenario Play, A+CCDRR". At first, let 35 students take the pretest that includes the test of school safety condition and emergency management level, as well as, the test of earthquake disaster reduction and emergency power. After finished the test, with the main line of coping earthquake, students watched two scenario plays in A+CCDRR, Don't Be Afraid, Grandma, I'm Be with You and Hopeful Red Kite, which aim at earthquake escaping and emergency shelters. Students and teachers actively discussed and interacted in which they learnt first aid knowledge by the course of safety scenario play, enhanced the awareness of safety and understood the basic ways to escape, self aid and mutual aid. Then, students were tested by new scenario of earthquake for determining the improvement of disaster reduction and emergency power.

Taking coping earthquake disaster as topic, 35 students from Qiyi Primary School, Yuying Primary School, Yuying Primary School, Cuiwei Primary School, Dinghuili Primary School, Tuqiang Primary School, Wuyi Primary School, Renmin University of China affiliated Cuiwei School (middle school) and Yuying School (middle school) took the pretest

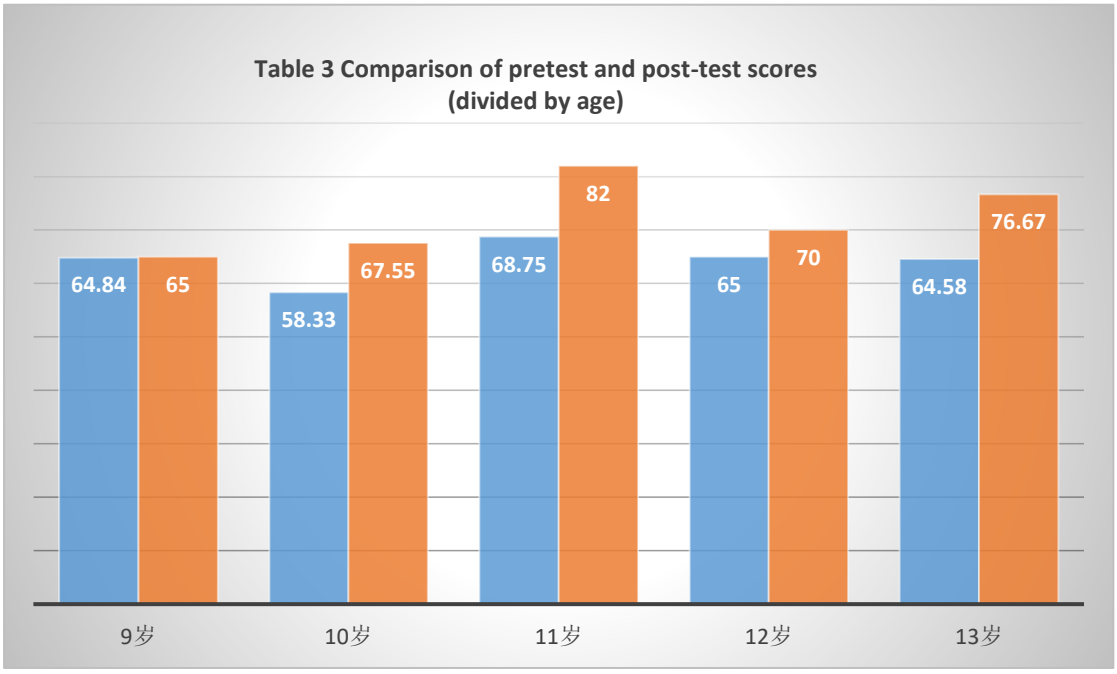
and post-test of “Risk Assessment and Preparedness Improvement Questionnaire of Middle and Primary School Based on Safety Education Scenario Play, A+CCDRR”. There 2 8-year-old students, 8 9-year-old students, 12 10-year-old students, 5 11-year-old students, 5 12-year-old students, and 3 12-year-old students among 35 students. In the testing, two 8-year-old students gave up the questionnaire survey due to it’s difficult to understand the questions and voluntarily participated in other ways of assessment. So the final valid questionnaires are 33. The collected data and analysis are as follow:



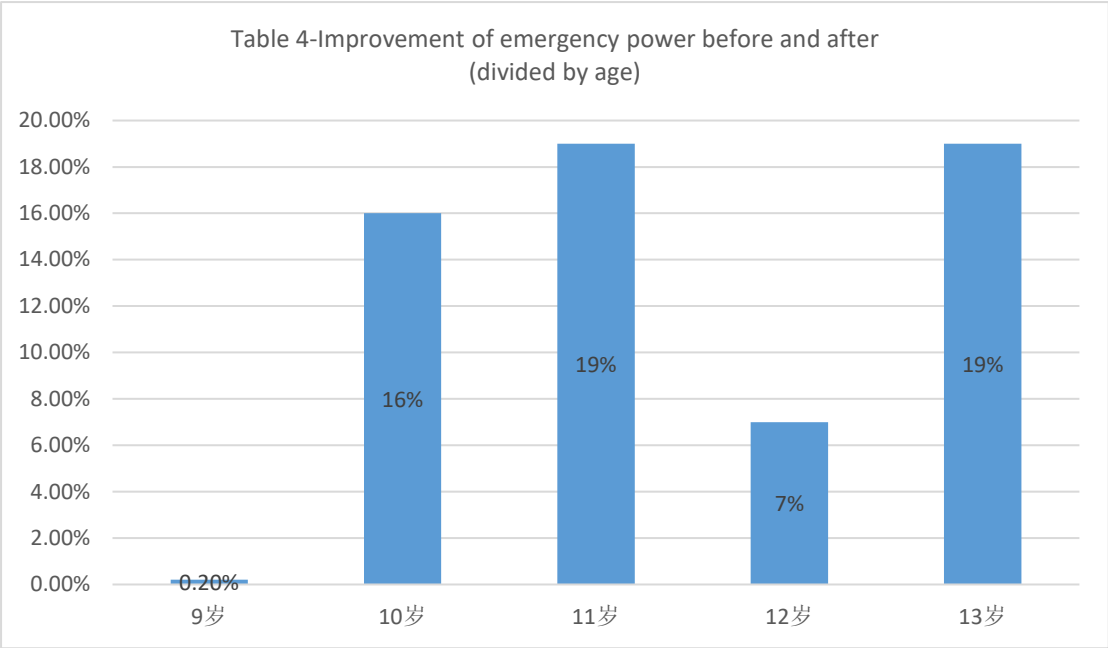
Pretesting score of earthquake emergency power



Post-test score of earthquake emergency power



Pretest Post-test



Percent of emergency power improvement in the pretest and post-test

In May.2018, the tool of school risk assessment and preparedness improvement based on safety education scenario play was officially approved as the school safety education and training in the Future School (Middle and Primary School) Guidance of Ministry of Education. According to the core mission set in Chinese Educational Modernization 2030, the future school research and experimental plans focus on the basic education and the development of teenage under 18-year-old and promote the transformation of school form and thorough reform and innovation by applying new concepts, thoughts and technologies of new era in which greatly implement the educational policy of the party and the country, promote quality education and cultivate innovative talents. In the development and future research, the Future School (Middle and Primary School) Guidance of Ministry of Education will be taken as the guideline of the tool of school risk assessment and preparedness improvement based on safety education scenario play in innovation and practice. Take advantage of the emergency culture and risk management in the safety quality education, scientifically and systematically teach though lively activities, adjust according to local conditions and continuously improve the practicality and operability.

We plan popular and apply the tool to 500 cities and regions across the country in the next 3 years. During 2018-2019, we plan to take Shanghai, Xiongan, Chengdu, Macao and other regions as experiment units and finish the construction of safety school demonstration project based on safety education scenario play. With the improvement of this tool, we

believe it will be applied to more and more schools, which will provide more safe and happy future for students in middle and primary school of China.

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