Exploring The Status Quo of Education and Stem Education for Left-Behind Children in Cities

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Abstract. After participating in community volunteer activities, the author investigates and analyzes the education and learning situation of left-behind children in the Cangqianshan Community, and thinks about the lack of education of left-behind children and how to educate more fairly. A questionnaire on the learning status of primary school students was used to survey 5 left-behind children and 113 non-left-behind children in Cangqianshan Community, observed through experimental courses, and interviewed the staff of the community to understand the family situation of left-behind children. The survey results reveal that there are notable differences in innovation and practical skills, as well as differences in learning ability in science, as well as significant differences in learning methods and attitudes, which are very similar to the effects of missing stem education. There are also differences in science learning ability. Therefore, left-behind children's overall learning conditions are worse than those of non-left-behind children; in particular, left-behind children who are accompanied by elderly people who are not their parents, lack learning and practice, and rely too heavily on electronic products in daily life; as opposed to left-behind children who are not accompanied by the elderly and do not have both of their parents' company (The two left-behind children mentioned above lack diverse and scientific learning methods). The stem education method should be appropriately adopted to improve the innovation and practical ability of left-behind children and create a knowledge situational environment so that left-behind children can have a good knowledge environment and better learning. On the other hand, it is time to increase family education and guide left-behind children to establish a correct concept of learning.

Keywords: Urban left-behind children; Stem education; Educational environment.

1. Introduction

The education of left-behind children has always been an important problem plaguing society, and it is also the focus of society. Many studies have shown that living separately from parents or one party will have a huge negative impact on children‘s education, which will not only have an impact on left-behind children in their adolescence but also have huge obstacles to their future development. With the development of society and the trend of urbanization, urban left-behind children have gradually become another huge group after rural left-behind children. According to the facts and data on the current situation of Chinese children in 2022, by the end of 2022, there were about 13.84 million left-behind children in cities and towns in China, but the school attendance rate Therefore, the difference between urban left-behind children and non-left-behind children is not different public education, but scientific education and family education, including but not limited to learning ability, learning attitude, and systematic learning methods, which is a problem caused by the lack of stem education. After missing the above content, a large number of left-behind children in cities and towns have malignant learning habits, truancy, boredom, and other problems compared with non-left-behind children, and even bring a lot of problems that plague society, such as the “ghost fire teenagers” in public security, the „problem students“ in schools, Unfair issues and so on. Therefore, it is extremely urgent to study the learning situation and education of left-behind children in cities and towns and to carry out appropriate education methods to narrow the education gap [1].

Cangqianshan Community in Fuzhou City is located in the old city of Cangshan District, Fuzhou City. With the economic development, a large number of migrant workers from all over the world gather to live here, so the number of left-behind children in the town is huge. As of January 15, 2023, there were 33,361 left-behind children in cities and towns in Fujian Province, and 5,207 left-behind

children in cities and towns in Fuzhou, mainly concentrated in Cangshan District and Mawei District. In addition, Fuzhou is also the hometown of China's main overseas Chinese and a second-tier city with five districts and eight counties, so the situation of left-behind children in cities and towns is very complex, diverse, and very representative and researchable [2].

Based on the author's participation in community volunteer activities, the process of teaching scientific practice courses to some left-behind children and non-left-behind children for grades 1 to 9 in the community has caused thinking: in recent years, the Internet has covered the whole world, and the times will move towards the next stage, and people will be trapped by the Compared with international children in China, their learning ability is extremely strong, but they lag in innovation. STEM is a brand-new approach to teaching that integrates the four main fields of science, technology, engineering, and math. The fundamental goal of this interdisciplinary learning approach is to develop students' creativity, problem-solving skills, teamwork, and exploration skills, which collectively make up the future society of children. In comparison to the conventional educational approach, it will be the area of competitiveness that is most fundamental [3-5]. It addresses the limitations of conventional education and starts with the requirements of the students. With the ultimate goal of developing students into a person with all-around development and learning ability, it not only attempts to absorb knowledge in the short term but also cultivates students' long-term potential.The significance of STEM education is not only that. It is separated from the importance of books in traditional education, but based on practical problems in real life, project-oriented, encouraging students to learn in an exploratory way and put forward their solutions. This gives students full freedom in the learning process, not the absolute dominance of teachers. It pays more attention to the learning process than the result. In the process, it allows students to hear different views, try different ideas, find problems, analyze, and solve problems in continuous trial and error.

Secondly, the significance of STEM education is also to cultivate teamwork ability, which is extremely important for people in today's society. People are group animals, and daily life and work are inseparable from dealing with others. Having teamwork ability will make children better know how to communicate with people and exchange opinions with others, resulting in one plus one more than two results.

The significance of STEM education is to cultivate children's sense of innovation through the process of hands-on practice. STEM education requires children not only to wait for the teacher to instill knowledge but to take the initiative to learn to use their own hands and brains to understand that results and processes are as important. Based on this heuristic teaching method, combined with hands-on practice and exploratory discovery, children's innate creative potential can be truly awakened.

Based on the above thinking, the author feels that according to the current education situation of children in society, STEM education provides a broad foundation for children, so that children have rich and balanced nutrition knowledge, and their future is full of infinite possibilities.

2. Research process

This paper adopts a combination of the literature method, questionnaire survey method, experimental method, analysis method, and summary method. First of all, the number of urban left-behind children in Fujian Province, Fuzhou City, and Cangqianshan Community is sorted out through the literature. The second step is adapted from the China STEM Education Questionnaire. Through the diversified and scientific education methods of STEM, a questionnaire survey was conducted on the left-behind children and non-left-behind children in Cangqianshan Community. The third step is to formulate corresponding courses for experiments based on the results of investigation and research, to discover the essential problems of the education of left-behind children in cities and towns. Finally, based on the above three steps, we will put planning suggestions for the education of left-behind children in cities and towns.

3. Questionnaire

According to the investigation and study of left-behind children in Cangqianshan Community, Cangshan District, Fuzhou, considering the practicality and effectiveness of sample collection, the respondents of the article are mainly left-behind children in grades 1 to 9 in Cangqianshan Community. A total of 100 questionnaires were distributed, 46 questionnaires were collected, and 40 valid questionnaires were collected. Among them, there are 20 left-behind children and 20 non-left-behind children, as the questions shown in Table 1.

Table 1. Questions in the questionnaire

Below are the questions asked in the questionnaire:
1. Do you usually live with your parents?
2. Did your school teach you about science, math, engineering, technology?
3. Your grade
4. Do you relate one point to another while the teacher is talking about it?
5. Do you feel that knowledge in class is isolated or combined with other knowledge??
6. When exploring a certain problem or phenomenon, will you give up because of insufficient knowledge of a certain subject??
7. If there is a problem in one subject class that requires interdisciplinary knowledge, how will your teacher deal with it

In the Question 1, 50% of children are left children, while the other 50% are unleft children. Then, below will illustrate the answer of the other question by several figures, for example:

Question 2: Did your school teach you about science, math, engineering, technology?

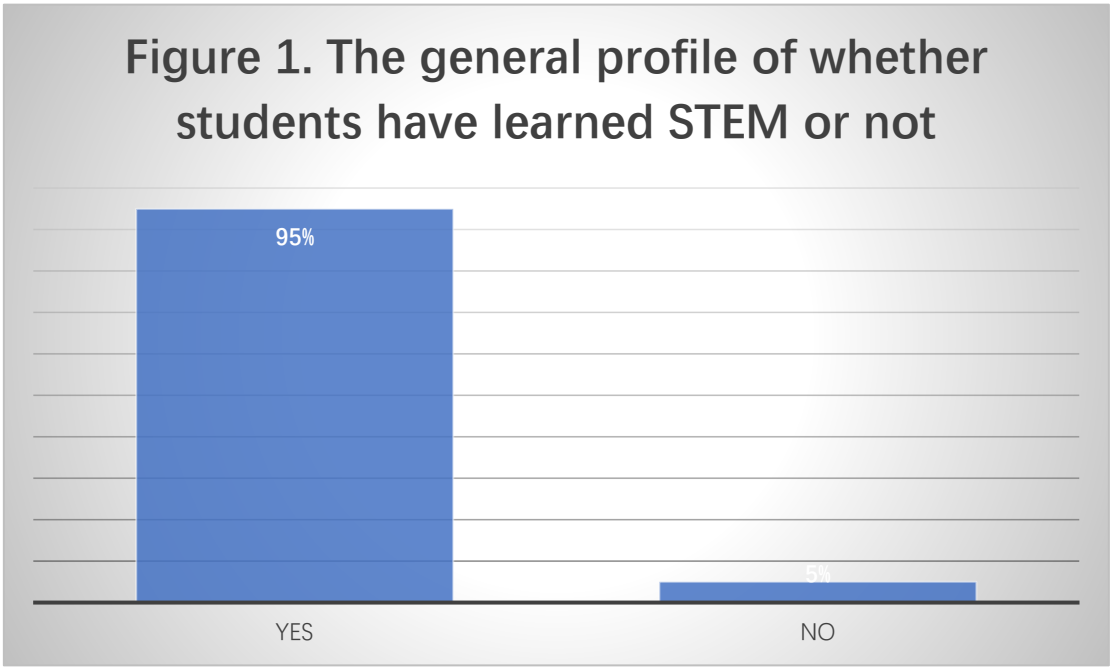


Figure 1. The general profile of whether students have learned STEM or not.

According to Figure 1, it is shown that 95% of participants have learned about STEM, while 5% of students do not.

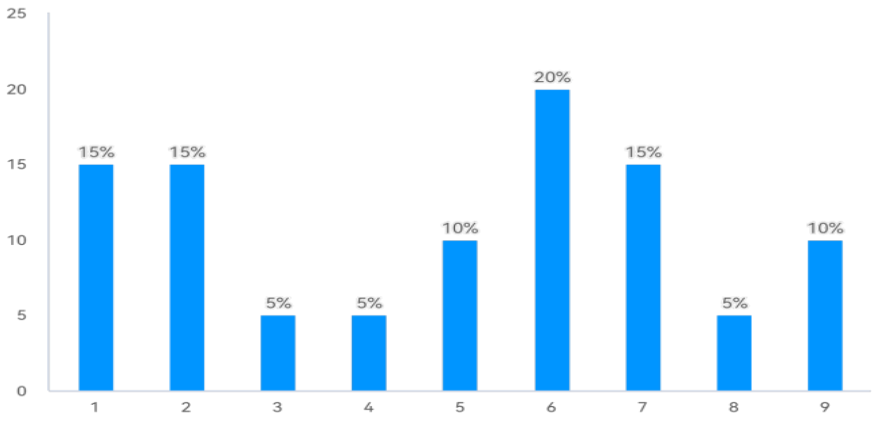


Figure 2. The grade of participant

Regarding the item of students'grade, it is shown that the largest proportion fall in the sixth grade of students (20%), while the other grade including grade 1,2,and 7 have the same grade of 15%.

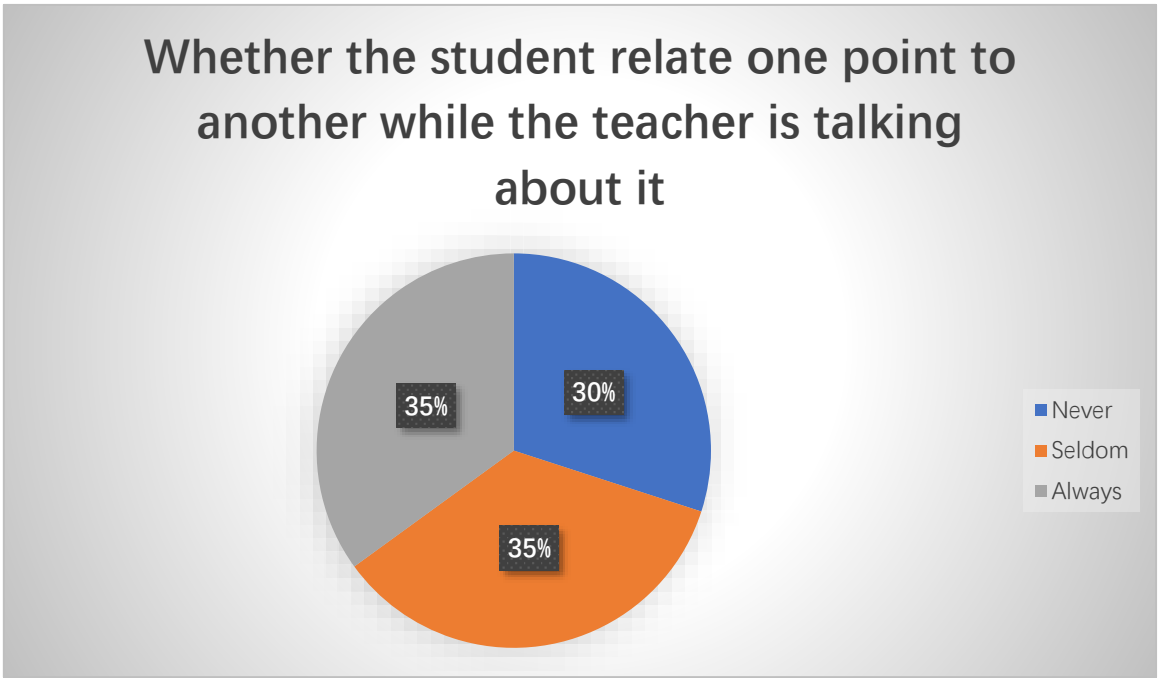


Figure 3. Whether the student relate one point to another while the teacher is talking about it

In terms of the question about "Do you relate one point to another while the teacher is talking about it? "it is found that 35% of students found they are oftenly relating to the point while the teacher is talking about and the other 35% means seldomly talking about.

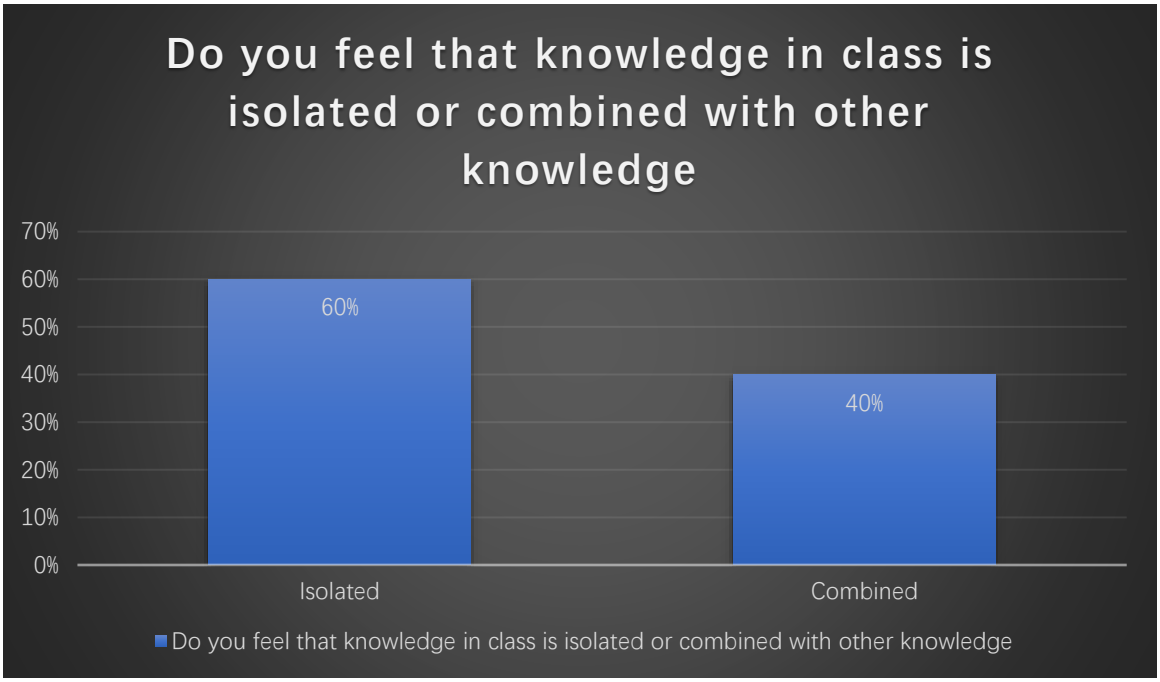


Figure 4. Do you feel that knowledge in class is isolated or combined with other knowledge??

In terms of Figure 4, 60% of students found that their knowledge is isologed with the other knowledge, while the other 40% found that they are combined.

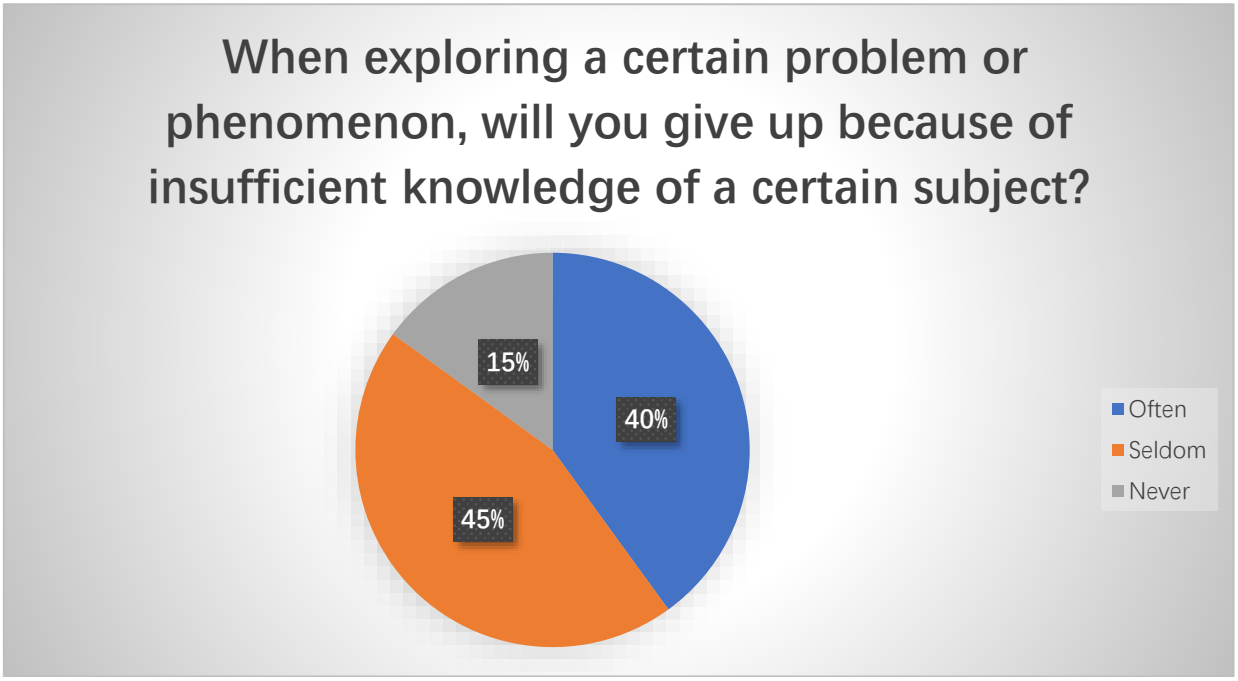


Figure 5. When exploring a certain problem or phenomenon, will you give up because of insufficient knowledge of a certain subject?

Regarding Figure 5, 35% of students will oftenly or seldomly give up separately because of insufficient knowledge of a certain subject, while the other 30% have never given up.

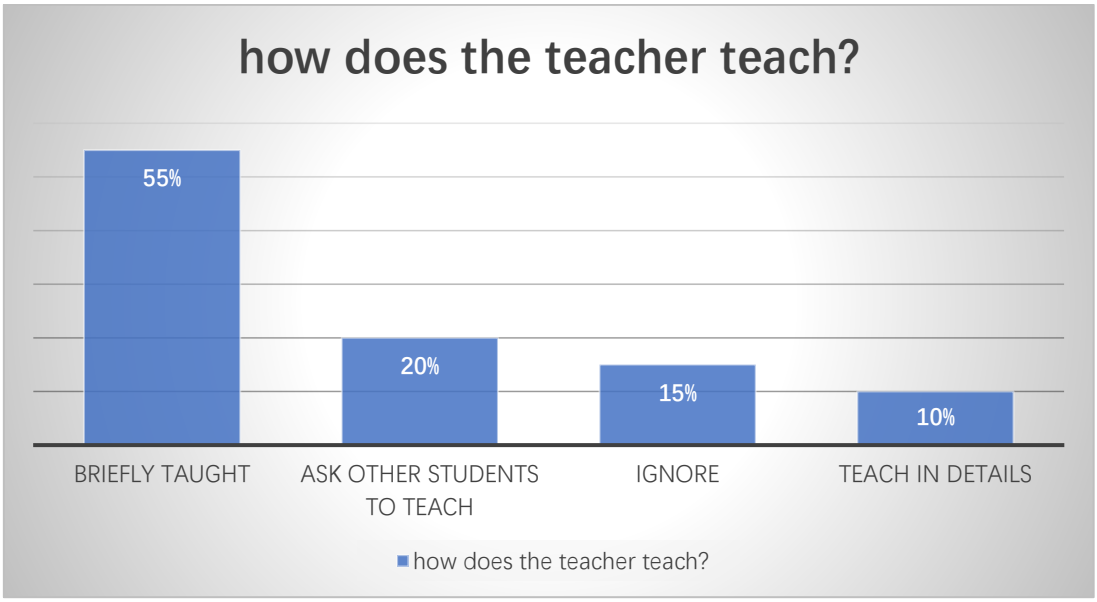


Figure 6. If there is a problem in one subject class that requires interdisciplinary knowledge, how will your teacher deal with it?

Lastly, in Figure 6, it is shown that most of the teacher (55%) teach about this problem mainly.

4. Experimental research

According to the analysis of the results of the questionnaire survey, we found two educational problems that can be studied in depth, so we decided to conduct a comparative experiment on the STEM course for left-behind and non-left-behind children. 1. Left-behind children are extremely weak in scientific disciplines in STEM education. 2. Non-left-behind children are weaker in practical ability than left-behind children, but their learning literacy is much stronger than that of left-behind children. Therefore, based on this result, the researchers decided to develop targeted courses and use STEM teaching methods to conduct experiments. First of all, research and observation show that left-behind pupils in grades 1 to 3 have the least grasp of astronomy in the STEM subject, which is the biggest difference from non-left-behind students. For the curriculum experiment, 20 left-behind and non-left-behind students in grades 1 to 3 were chosen as samples. Celestial motion is the subject of this experimental course. Children can associate, concentrate on the central issue of "what is a planet", and then gather the experimental results through painting and questioning by first understanding the natural ring mirror, gradually introducing the cosmic world, and using pictures, videos, and instruments.

According to research and observation, it is found that children in grades 1 to 3 of non-left-behind children are very weak in practice. Therefore, 20 left-behind children and non-left-left-behind children in grades 1 to 3 were also taken as samples to conduct experiments and research on technical disciplines in STEM education. The experimental course focuses on the theme of "how to make a lantern (a traditional Chinese lamp)" so that children can assemble by using parts, understand the principle, and finally evaluate the most works. The researchers obtained the experimental results by collecting the lanterns made by children, their evaluations, and the process of making lanterns by children.

5. Discusssions

Compared with non-left-left children, left-behind children lack scientific knowledge in STEM education for two reasons:

(1) Even though they have a strong macro-imagination (expressed in their imagination of planetary painting), left-behind children lack access to nature-related courses and learning both inside and

outside of school. Non-left-behind children, on the other hand, will have extracurricular classes in things like musical instruments, science, and mathematics. Lack of knowledge sources (on-campus classes, mobile devices, TV programs) will continue to constrain creativity and innovation.

(2) The lazy attitude towards learning and the school's learning environment lead to left-behind children rarely combining knowledge without the supervision of their parents. As a result, the four disciplines of STEM do not support each other, complement each other and develop together in their thinking.

Compared with left-behind children, non-left-behind children lack practical ability in STEM education for two reasons:

(1) Non-left-behind children have a higher absorption capacity than left-behind children, but they cannot convert the absorbed knowledge into practical content. Because teachers in the lower grades can only teach children basic knowledge theory and rarely apply it, resulting in children's lack of practical ability.

(2) Non-left-behind children are more " spoiled" than left-behind children (they have not done housework and other manual work at ordinary times), resulting in the most basic common sense problems when making many parts, which eventually leads to the lack of practical ability of non-left-behind children.

6. Conclusions

Urban left-behind children are essentially as capable as non-left-left-behind children in all aspects, and the school curriculum is "isolated" and "disciplinary" compared with STEM education. Especially for the public schools attended by 80% of urban left-behind children, left-behind children are often guided by isolated learning methods. The lack of the overall educational environment cannot produce "context" thinking, the lack of the overall way of thinking, and the various disciplines will not associate with each other. Non-left-behind children will take some off-campus courses outside the school with the intervention of parents to diversify and supplement the on-campus disciplines, so that the disciplines will be integrated, resulting in the learning ability, thinking ability, and innovation ability of non-left-left-behind children being higher than that of left-behind children.Left-behind children in cities and towns often have a lazy learning attitude due to family reasons. It is difficult to integrate families, schools, and communities to manage students, so students will not subconsciously think deeply about the knowledge, let alone support each other, understand each other, complement each other, and develop together with the knowledge they have learned. Below are some suggestions to propose:

The school popularizes the concept of STEM education to teachers, builds a learning and teaching network in the school, and no longer regards STEM education as a simple "hands-on" class, or "operation" class, but should truly practice the theory of integrating multiple disciplines, instead of floating on the surface. Schools need to change the training mode of students, promote the information-based and scientific education model, cultivate students' innovative thinking ability, build an off-campus learning system for urban left-behind students, including supervision system and teaching system, integrate diversified knowledge into interesting forms, and set up as interesting as electronic comic knowledge books. Teaching books, including cartoons that spread multiple knowledge, can be accepted by urban left-behind children, to build a knowledge environment for urban left-behind children, cultivate an innovative spirit, and help them integrate knowledge.

The community should promote the form of family, school, and social union, which can promote enterprises to set up scientific laboratories in schools and develop maker space technology. Through maker activities and courses, left-behind children can be exposed to the most cutting-edge technology, cultivate their innovation ability, and bury the goal of scientific innovation in their hearts. Develop interesting STEM practice activities such as Fab Lab and DIY in the community to increase the extracurricular life of urban left-behind children.

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