TO PROMOTE THE 4DU ECOLOGICAL CONSTRUCTION OF K12 EDUCATIONAL PRACTICE BY HANDS-ON INQUIRY BASED LEARNING

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Thematic Certificate

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ABSTRACT

Learning is vital in human behavior and has always been an essential focus of educational research. In the past 20 years, creator culture and online education have penetrated urban science and formed the emergence of online knowledge and offline classroom mixed learning. Through literature review, analysis of the construction role of K-12 technological innovation education environment in learning practice, compared students' learning effects in a diversified environment, and used this discovery to improve teaching guidance and education investment management direction. The multi-scene framework of science and technology innovation education, as compared to the current situation of modern science and technology innovation development, forms a 4DU (Design and Unite) ecological chain of community exploration, science and technology activity centers, research bases, and science and technology museums at different levels. It uses the collection and modular physical space teaching environment and experience transformation for evidence-based practice of the learning process. It enables learners to exert their attention, initiative, and creativity into practical experience. It shows that when social resources are willing to invest and participate in research, they are linked when supporting comprehensive practical scenarios. Various environmental and social resources contribute to forming new learning organizations, thus improving the quality of comprehensive teaching and educational innovation.

Keywords: constructivism theory, hands-on inquiry-based learning, HIBL, tinkering, mixed learning

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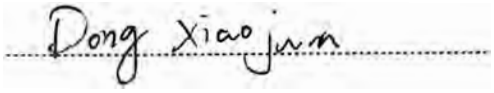
Dong Xiaojun
April 18, 2023

DECLARATION

I, Dong Xiaojun, hereby certify that the work embodied in this independent study entitled "To promote the 4DU ecological construction of K12 educational practice by Hands-on Inquiry Based Learning" is result of original research and has not been submitted for a higher degree to any other university or institution.



(Dong Xiaojun)
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1 Introduction

In this chapter, the background for educational technology around Integrated and modular physical space, followed by the problem statement and the purpose of the study, the significance of the problem, and finally summery that study its progressive, optimized, and inclusive practical ecological body.

1.1. Research Background

Environment is an important resource for education, which should effectively promote the development of learning through the creation and utilization of the environment. In the 1980s, DIY, garage culture and the birth of makers were all spontaneous exploration of technology preferences and life applications, creating generating conditions for the further combination of PBL teaching and research and exploration. As a scientific teaching concept, method and mode, research-based learning has listed "Hands-on Inquiry Based Learning (HIBL)" as one of the important principles of basic education reform. Since the beginning of the 21st century, 3D printing technology, Arduino open-source hardware and various new technology exchange platforms are shared, further reducing the threshold and cost of scientific and technological innovation. Not only ordinary technicians, including some middle and high school students, can also intervene in the technical experience and complete some simple creative works to share. In February 2005, "MAKE" Maker magazine was founded in the United States. In 2009, the United States launched an Action on Education Innovation (the Educate to Innovate Initiative). At that time, countries all over the world followed suit. In 2011, different cities in China such as Shanghai, Beijing and Shenzhen also created maker space, which led to a group of makers who tried to create and practice creation. The revolutionary author of the learning scene, Thornburg mentions that scene interactive integration will occur anytime, anywhere inside, outside, home, or outside home (Thornburg, 2020). With the interdisciplinary promotion of STEM, the demand for educational practice has driven the popularization of information technology courses. Simple technology products, software and hardware programming products and artificial intelligence courses have been gradually integrated into K-12 courses. With the integration of art and design in more educational works, STEM has added elements of ART, forming the current interdisciplinary concept of STEAM, among which HTH (High Tech High School) is a typical example of the integration of new technology and design (Kumar & Sharma, 2017).

In the new technology changing the traditional teaching habits, another driving

force should be the support of Internet online technology for education. With the benefits and importance of using network technology in Internet + education, the education service originally driven by the supply side will be gradually transformed into a learner-driven system service. Learning and analysis technology, Internet of Things technology, artificial intelligence technology, network security technology, and a new service mode of high-quality, flexible, and personalized education, spanning the boundaries of schools and classes and facing individual learners, are the new means and innovative characteristics of the development of online education (Slotta & Linn, 2009). With the deepening of online technology participation in teaching progress, blended learning and PBL have become effective tools for students to exert their independent potential and improve their academic progress. Many blended learning courses combine online learning with thematic research learning to integrate each subject knowledge and help students explore real-world problems and challenges, with the aim to inspire students to gain a deeper understanding of the subjects they learn.

Education has the support of the network after the time and space communication restrictions. The intervention of operational practical courses such as 3D printing and Arduino programming has also expanded students' enthusiasm for technological innovation and intelligent manufacturing. In addition, from technology development to history, technology museums, science and technology museums also play a strong support for science and technology enlightenment and science communication (Bergman & Sams, 2018). In 2022, according to the popular science venues, there are 408 science museums and technology museums in 2020, more than 600 science museums and science centers in the United States, and more than 30 independent science centers in the UK, including the famous Bristol Exploration Museum and Wales Technology Exploration Museum.

In the face of such rich social resources, how should we make good use of the scientific and technological resources around us to create a deeper learning scene space for students is an opportunity of The Times of educational innovation.

1.2. Research Problems

With the progress of science and technology, students also need to operate and experience to do a good job of process intervention, which is a necessary process of technology mastery. In this respect, the school cannot complete the output of supporting courses due to the lack of teacher preparation and weak technical ability. We need to form paid education services with the help of off-campus research and environmental innovation equipment from maker institutions. In participating in research and experience activities outside and on campus, I also noticed that most of the science and

innovation courses in each research and science and technology center were built independently, and the contents are incompatible with each other, which easily leads to the repetition of learning content or the difficulty of advancement. Due to the above phenomenon, I propose the following two in-depth research questions:

1. In the multi-environment of technical experience, how to use the research structure to optimize the learning ecological environment around us.

2. Offline technology experience promotes the digital generation of online content in educational innovation. How to explores the business investment to promote the deep learning prototype of OMO education model in technology experience.

1.3. Objectives of the study

1. In the multi-scene field experience of technology, how to transform the offline content into teaching content needs to find the relevant basis that can be supported and solve the service sharing of educational resources for K-12 research education.

2. Research education is a technical opportunity for the society and enterprises to participate in education. Giving full play to the cooperation advantages of science and technology innovation education guidance and market business alliance, it will drive the ecological environment of research symbiosis.

1.4. Scope of the study

The pedagogy and impact on students of STEAM-based interdisciplinary instructional design and related intelligent instructional systems, computer-based instructional systems, and web-based instructional systems in an era of great Internet and AI technology development. Integrated and modular physical spaces: science and technology museums, HIBL places, workshop centers, community environment innovations with common technological enlightenment. Combined with interdisciplinary integration and with blended learning as an enabler, it is possible to study its progressive, optimal and inclusive practice ecologies.

1.5. Research Significance

The best scenario of learning is not a simple abstraction, but in the real-world situation and practice, to solve the specific problems in real life; in the effective practice activities independently involved in learning, learning how to use the first knowledge structure to solve the practical problems, is the key to measure whether the learning is effective and successful.

In terms of urgency, with the advent of the era of artificial intelligence, people are committed to turning machines into people and realizing the self-learning of machines. And if our teaching only allows students to conduct shallow learning and mechanical learning to turn people into machines, human beings are bound to face the danger of being replaced by machines (Li, Yang, & Xu, 2022). Learning is not a one-sided memory process, but a cognitive process that requires the continuous construction, deconstruction, reconstruction and rebuild of the correlation between the old and the new knowledge. How to maximize the play of learners' subjective initiative is the best guidance of teaching design.

2 Literatures Review

After thousands of years of rapid development, technology has experienced superposition and innovation in different periods, and its continuation and status quo have long been tortuous. If it hadn't been for the simple laboratory scale or the initial thinking at the beginning of the beginning, how could it directly sink to primary and secondary schools and meet simplified technologies in the teaching way? This requires the transformation and screening of educational technology, the original technical difficulty to be weakened or the knowledge points refined and compiled into different difficulty ladders to gradually digest. Establish a step-by-step learning system that students can understand, including task analysis and feedback evaluation of scientific experiments. Teaching hardware such as exploration tools, basic equipment, consumables, how to match environmental construction, etc. are all matters to consider. This situation has appeared all over the world, which is accompanied by new possibilities, such as the development of educational technology Internet, hybrid learning innovation, research practice and Steam with the gradual attention of interdisciplinary concepts, the change of future education and life survival was born in this change in demand.

2.1. Constructivist Theory

The earliest propones of constructivism can be traced back to Switzerland. Piaget (J. Piaget). Constructivist theory holds that the learning of knowledge should be constructive and unfolded in the process of continuous practice. The process of learning is not a process of absorbing new knowledge, but a process of constantly integrating knowledge, innovating, and then understanding new knowledge. Constructivism also believes that knowledge is not only an accurate definition of reality of knowledge about reality, but also an expression and interpretation of the objective world by the learner,

which is stable and temporary. The acquisition of knowledge is the result of subjective and objective interaction, and the activities of the interaction of subject and object are the source of all knowledge generation, emphasizing the internal generation of knowledge and subjective initiative (Steffer & Gaea, 2004).

Under constructivism theory, learning is not passively receiving information stimulation, but actively constructing meaning. According to your own experience background, external information is actively selected, processed, and processed to obtain its own meaning. Vogotsgy The "Recent Development Zone" theory established attaches importance to the role of the sociocultural and historical background of learners in the environment in the cognitive process to carry out teaching construction, creating theoretical conditions for practical application to the teaching process (Berk & Winsler, 2007).

2.2. Hands-on Inquiry Based Learning, HIBL

It focuses on practice and operation, and the types of research are carried out according to practical operation and experience activities. Researchive learning Abbreviated as research , collectively referred to as Exploratory learning Hands-on Inquiry Based Learning(HIBL)，It refers to the learning process of students-centered, in a learning environment composed of teachers and students, based on students' original concepts, allowing students to take the initiative to ask questions, explore and learn. Research is an out-of-school education activity that combines research learning and experience. It is a practical learning form that connects school education, social education, and family education. (Fu & Wang, 2020).

Mr. Deng and others found that research is different from the teaching of existing disciplines. It is no longer limited to the teaching of pure book knowledge to students, but let students participate in practical activities with textbooks and learn to learn and acquire various abilities in practice. Of course, the meaning of "practice" here not only refers to social investigation and data collection, but also includes a series of topics such as topic selection, formulating study plans, listening to expert lectures in universities and scientific research institutions, consulting experts and scholars, writing research reports, etc. Exploratory (PBL) Learning The process (Deng, Jiang, & Liu, 2021).

For example, there are agricultural research, scientific and technological research, natural research, research tourism, etc. In this paper, I mainly focus on science and technology innovation research as a model, including science, technology, and innovation exploration practice. Maker education, Science and Technology Innovation Research Follow free, open, innovative ideas and Explore the experience，Integrate

science, technology, engineering, art, mathematics and other knowledge and skills to encourage and guide children of different ages to develop their potential, which is conducive to21Coexistence and win-win in the context of diversity in the century (Martinez & Stager, 2021).

2.3. Tinkering

This word first appeared in13 Century, it is used to describe those who can repair everywhere. Repair all kinds of household utensils the craftsman of.20The semantic extension of Century Tinkering originated from Seymour Papert, a mathematician, computer scientist, educator, the proponent of constructivist learning theory and inventor of LOGO language at the Massachusetts Institute of Technology. Papert pointed out in its book Mindstorms: Children, Computers, and Powerful Ideas that good education is not about how to make teachers teach better, but how to provide sufficient space and opportunities for learners to build their own knowledge system (Sawyer, 2010). Children build knowledge and understand the world through visible handicrafts and models. Teachers' responsibility is to provide conditions for learners' innovation, not to provide prepared knowledge. When children are making works that they are interested in and valuable to them (such as making stories, making small machines, programming, or composing music), they are in the best state to learn knowledge (Papert, 2019).

Professor Resnick pointed out in his book Lifelong Kindergarten that Tinkering is an inspiring thinking between creator production and game play. It is an important potential experience of creative creation in the early stage. It is also a driving force bridge to keep curiosity to explore during the research process (Resnick, 2018). Resnick is a student of Professor Paper. He continues his teacher's research and proposes that curiosity is a prominent feature of Tinkering. It is the inner psychology of an individual who instinctively wants to add the attributes of something when all or part of the attributes of something are blank. The psychological tendency to pay attention, manipulate and ask questions when individuals encounter novel things or under new external conditions is one of the internal motivations of individual learning and the driving force for seeking knowledge. It is an important feature of creative talents (Zhou, 2023).

2.4. Mixed learning

Early online courseware basically doesn't matter where students learn something, whether at home or in the computer room. In the library, students can carry out their

own independent and self-contained courses. It doesn't matter where the actual location is (Arsenio & Emotionality, 2002). Innovative school leaders and teachers in order to make Majority Students benefit from online learning, and they try their best to combine online learning with the traditional classroom experience, so "mixed type" the word learning was born, and about 21 The beginning of the century， Entered the thesaurus of primary and secondary education in the United States.

The author of the book Mixed Learning gives an example. If students learn history in a mixed learning way, they will face the components of the classroom online and face each other organically and teach the overall curriculum comprehensively. Conversely, if students want to revisit online learning content in the classroom, it is not a comprehensive experience. To prevent such teaching content from collaborating with disorders, most hybrid learning tutorials use computer data systems to track the learning progress of each student, intending to cooperate with the form and process of learning (Horn & Staker, 2016). Flip-up classes are often used as a mixed way. Students either autonomously or feel that they continue to learn outside the classroom. It is still important for students to recognize and utilize students' views, ideas, and existing knowledge in mixed learning, and even use them as a learning resource (Bergman & Sams, 2018).

Because most parents and students need that the school is not only virtual, More substantively, the mixed form of online learning and campus classroom represents a breakthrough in online teaching, so it has been integrated into the mainstream education system. It has become a necessary link in the physical teaching classroom.

2.5. Practical Research on Life as Education

Constructivism is a theory about knowledge and learning, emphasizing the initiative of learners. Learning is a process of generating meaning and constructing understanding based on the original knowledge experience, and this process is often completed in social and cultural interaction. The earliest propagator of this theory can be traced back to Piaget in Switzerland. J. Piaget is one of the most influential psychologists in the field of cognitive development. He insists on studying the cognitive development of learning from the perspective of the interaction between internal and external factors. In his childhood, he believed that children gradually constructed knowledge about the outside world in the process of interacting with the surrounding environment, to develop their own cognitive structure.

2.5.1 Tao Xing Zhi Thought---- Life is education. Society is school.

Tao Xing Zhi, a Chinese education tutor, believes that it is necessary to guide students on how to reconfigure space, time, technology, and manpower in education,

so that they can better review the past and face the future, and improve the research of "startup enlightenment". In this field, Tao Xing Zhi proposed "Life is education. Education is carried out in all kinds of life to promote the popular education of the public in society. Expanded, Tao Xing Zhi also proposed that "society is a school", because under the proposition of "School is society", there are too few things in the school. It is better to advocate 'society is a school'. The materials of education, methods of education, educational tools and educational environment can be greatly increased, and students and gentlemen can be increased (Tao, 2014).

Tao Xing Zhi's proposition that "society is school" is the same as "life is education" in opposing the disconnection and isolation of traditional education from life, school, and society. He believes that "school is society, just like catching a lively bird from the sky and locking it in a cage. It has to absorb everything in society in a small school, so it is easy to cheat." Moreover, this kind of education has created a high wall between the school and society, separating the school from social life. Tao Xing Zhi proposed that "society is a school" is to "place the birds in the cage in the sky so that they can soar at will", to dismantle the high wall between the school and society and stretch everything in the school into nature (Zhou, 2023).

With the call of the era of science and technology, in recent years, the integration and development of science and technology education in primary and secondary schools has begun to participate deeply, among which computer popularization is a major technical foundation. Environment and knowledge gradually experience the transformation or application of life, opening different flowers of educational innovation.

When early computer teaching improves to information technology teaching, how to use and apply software to control external hardware has room to imagine and operate, so the construction of science and technology innovation laboratories has become an upgrade standard configuration to realize the new integration of teaching. It started with laboratories in junior and senior high schools, and the construction has only been followed up in recent years in the primary school stage. First, the school should screen manufacturers to provide teaching simple robot software and hardware, create a classroom environment, and then train and transform professional teachers. After nearly ten years of teaching, looking back at its effect, it is not ideal. To sum up, there are about two major factors: lack of professional engineer experience or skilled personnel in the primary school teacher team; and the use continuity of school facilities due to insufficient equipment or discontinuous renewal. So, in 2016 There are two kinds of educational flows in the year: one is to introduce out-campus experienced technology or talents to supplement the shortage of teachers in the school; the other is to send students of different grades to professional science and technology venues for a day or more day of research experience. This is why the education market presents a market

supplementary mechanism when there is demand, thus forming a unique distribution of the technological environment, such as the community. Centigrade End-end demand, technology inclusion in science and technology centers, and the creation and publicity of research disciplines have emerged one after another (Feng, & Duan, 2012).

The National Education Association, the largest trade union in the United States, passed a policy to support digital learning at a meeting in July 2013. They think this decision is correct, because digital learning not only provides opportunities for students to contact, learn online and mixed learning, and to make progress every day, but also benefits teachers from it. From the perspective of teachers, the rise of mixed learning provides more new opportunities for teachers to be exposed to career-related achievement, recognition of responsibility, growth, and other economic factors. Taxi it is true that it is difficult to meet the requirements of students and teachers at the same time, but mixed learning presents a variety of ways and opportunities to do a good job in both groups at the same time, which is the result of life perception experience and adaptive needs.

2.5.2 Case Study: Educational Practice in Noble Forest, Canada.

Cultivating compound talents with innovative spirit and practical ability has become an important task of education reform in various countries today. STEAM education is a model for cultivating more mature compound talents.

STEAM education was first proposed by the U.S. government. STEAM is the initials of Science, Technology, Engineering and Mathematics. The promotion of STEAM aims to encourage children's development and improvement in science, technology, engineering, and mathematics, and cultivate children's comprehensive literacy, to improve their global competitiveness. STEAM was developed from STEAM and added Arts, that is, art, and became more comprehensive. In the concept of STEAM education, paying attention to the cultivation of practical ability and applying STEAM education theory to information technology teaching in primary and secondary schools is conducive to promoting the all-round development of students, improving the comprehensive quality of students, and making classroom teaching more novel (Wilkinson & Petrich, 2018).

STEAM education in the noble forest school district has been carried out soundly. They emphasize programming-based teaching and design thinking modes and offer STEAM courses since primary school and present a spiral process. For example, junior children may not do programming, but they will learn to operate computers and connect their lives with the objects around them. In middle school, they enter the field of technology (Prensky, 2001). The school begins to gradually cultivate students' design ability, and all students need to learn how to use computers in depth. When they reach high school, students need to learn to use more tools, and teachers also hope that they

can use these tools to solve some more complex problems. The following is combined with specific cases to introduce in detail the specific practices of the implementation process of STEAM education in Gao Guilin School District. Let's see how they combine learning with solving life problems, and how teachers guide students, support students, and promote their growth in this process (Schulz & Pinkwart, 2015).

Micro: bit, a programming tool often used by Coqui land for STEAM education, is a microcomputer for youth programming education launched by the British BBC. It is a highly flexible and programmable embedded device. This small development board is only half the size of the credit card, but it integrates acceleration sensors, magnetic sensors, two programmable buttons, 25 monochrome LEDs and other devices. The BBC also provides a supporting online programming website, which can be programmed through a graphical programming interface or through programming languages that students like python or java script. Finally, you can upload the written program to the Micro: bit development board through Bluetooth to see the actual effect. Micro: bit official website provides a simulation program of the programming board, which can preview the programming effect in real time, so you can start trying micro: bit without buying a real "small board", and all of which is free. Although they can't run the full operating system, students can use BBC micro: bit to achieve any cool gadget.

As a close neighbor of the United States, Canada has developed rapidly in the field of STEAM education, and its curriculum is also quite distinctive. In teaching, they pay attention to integrating science and technology into life. In the process of solving problems in life, they often cultivate the skills, strategies and thinking habits needed for science and technology to solve problems and understand the relevant concepts of science and technology. At the same time, they attach importance to field integration and cross-disciplinary intersection and pay attention to all children (Arsenio & Emotionality, 2002).

2.6. Developing Educational Technology

2.6.1 Ecological chain concept of urban diversification, science, and technology innovation enlightenment practice.

At the beginning of the year 2020, the world was deeply troubled by the epidemic. School education was regionally stagnant because it was a highly aggregated social unit and affected by the control of the epidemic. China is a large country, provincial education departments have proposed measures to suspend classes and non-stop learning, and launched an online course system that was deployed and controlled in the early stage of educational technology. After the digital dissemination of information

platforms and teachers open a network, students can listen and teach synchronously at home (Yang, Zhang, & Li, 2019). Live broadcast, recording, micro-course storage, online discussion, famous teacher classroom and other forms have completely subverted the scene interaction of the original traditional education. Two years have passed, name Teacher’s Studio Also continue to provide Provided by the school digitize course to supplement the reserve of schools to build resources in multi-channel space and expand network information search and group community sharing. During the epidemic, students suddenly accepted the autonomy of long-term online interactive learning, and never adapted to gradually master the digital space path obtained from learning, so that network resources can become the normal coexistence of education (Galotti, 2005).

We can see that other countries are also encountering new social problems to varying degrees, such as modernity. In society It has appeared. Simple manual labor quilt machinery assembly line, replaced by artificial intelligence, external compete environmental. international openness and inward contraction have been put forward for the future. Person "What is needed Unique creativity. Abundant Life Emotion. From people Education Growth to analyze. Everyone's knowledge system and intelligent structure are basically built by himself. If everyone learns the same course and does not have enough time and space, students can't achieve this mature constructed. First, it is necessary to give students the choice of content and the time and space of learning to truly realize this possibility (Emoto & Okano, 2005). For example, the Atlanta Laboratory in the United States belongs to this new type of learning center. Most of these are local students who set up their own learning programs to help their cities open a sustainable future and cope with the air. Water quality, public transport, Shared energy, and poverty issues. These students provide activities such as research, thinking and debates throughout the semester, carry out project-based learning, and will hold an exhibition night after learning. Give their friends, classmate, the teachers' families, and the community showcase their works. Here Knowledge learning itself has changed from an end to a means education does not cultivate encyclopedic knowledge holders, but people who can use knowledge to explore new knowledge and create (Martinez & Stager, 2021).

The above questions are about the possibility and preliminary need for research ecological construction.4Dimensional design. Take activity space as a regional resource, combined with the Internet+Education allocates the content of activities for the science, technology and learning practice of each sector. I propose "4DU Research" (Design and Unite) The idea of educational ecological construction is to connect primary and secondary schools in series. STEAM, the internal hybrid learning mechanism of the science and technology innovation base jointly discusses the large-

scale research enlightenment model of resource optimization. Technology is everywhere, and the impact of the environment is also around us. How does the relationship between technology and people show the future trend? Will people be replaced by machines? Do professional skills need to transcend human intelligence? Professional and technical research is a field where enterprises or research institutes embark on high-depth technical difficulty. Continuous optimization focuses on innovative breakthroughs in products or technologies. The enlightenment communication of educational science and technology innovation is generally natural science cognition, technical knowledge point theory and simple mechanical assembly or intelligent programming, and the focus is on the cultivation of the quality literacy of the subject in the school days. Scientific methods, scientific spirit and scientific thinking are far more important than scientific knowledge itself (Horn & Staker, 2016).

Imagining a lifelong learning society, the ecological fertile soil around you supports each other. What school you graduated from and what diploma you have will no longer matter, what matters is how you stud, get together what kind of knowledge structure do you have? Only by being different can we innovate the future." To get close to this goal, we will focus on two questions later. The first is whether there a common educational phenomenon interspersed with technology connection between various technological environments? The second is that it is different from the knowledge-based network of online disciplines. How can technical practical operations effectively rely on the content generated and digitized in the unique environment, and become a new learning organization in the future, with investment entrance and value (Chen, 2019).

3 Research Methodology

This research Observation of the ecological combination of operational environment around live, Qualitative analysis is used to analyze the current situation of education through literature review and explore the relationship between new environment and science and technology education. Case study method and Analogies introduce the practical attention to science and technology innovation education, how to enable students to make good use of social and public facilities and the educational environment around them. Participate in the exploration experience of science and technology with great interest will become a strong support for scientific literacy and the improvement of scientific literacy.

3.1. Primary Research

1. This research process mainly explores the research of integrated and modular physical space--4DU Ecological structure (science and technology museum, research site, activity center, community environmental innovation), looking for the underlying logic of science and technology innovation enlightenment; Relying on hybrid learning construction and educational technology software and hardware as boosters, Bridging the design and research content of environmental innovation gaps at all levels, and gradually present an evidence-based practice ecology that can be progressive, optimized and inclusive. The transformation between disciplinary memory knowledge and the practical transformation of life is conducive to the establishment of a learner's knowledge system, to make knowledge more useful. Because practitioners can cultivate learners' thinking and practical ability, so that learners can have a deeper understanding and master relevant knowledge and can also better help learners apply knowledge to real life. Cultivating talents is the core task of education, and education must be people oriented. It is based on respect and care for everyone and cultivate the all-round development of learners, improve their own values and capabilities, and enable them to achieve better development and achievements in society.

2. Lifelong learning is a long-term thing to improve personal quality, and the influence of environmental factors is ubiquitous. This paper also takes the teaching of artificial intelligence courses in the Analytical Science and Technology Center, Shanghai High School, and the Noble Forest School District of Canada as cases to present the practice of how education in different countries provides operability science and technology in different environments, and to find the root causes behind the enlightenment of science and technology innovation courses to technical practice, product design and project feedback. The main purpose of human education is not to meet the standards of mathematics and science (Jiang & Zhang, 2020). At the same time, qualitative research can also help researchers grasp the demands of education more comprehensively and humanely, to improve the educational environment and achieve the ultimate progress of social development.

3. In the analogy, the research status that has been formed is mainly used to compare the market generation model, and the comparison is in a new gradient formed in the co-construction of the resource alliance of social forces and education teams Ecology Loop, showing the prototype of survivable learning tissue, A constructible channel is explored to further connect future trends with investment collaborative optimization.

3.2. Research Methods

3.2.1 Qualitative analysis

Qualitative analysis is to analyze the quality aspects of the research object. Specifically, the methods of induction and deduction, analysis and synthesis, abstraction and generalization are used to process the various materials obtained, so that they can extract refinement, hypocrisy and preserve truth, from the table to the inside, to understand the essence of things and reveal the internal laws.

Qualitative research mostly obtains first-hand information by participating in observation and in-depth interviews. The specific methods mainly include participatory observation, action research, historical research methods, and ethnographic methods. Participating in observation is a method often used in qualitative research. The advantage of participating in observation is that it cannot only observe the reasons, attitudes, effort procedures and the basis for action decision-making of the observed person. Through participation, researchers can obtain the feelings of a member in a specific social situation, so that they can understand the action more comprehensively. Then, through the information obtained from observation and interview methods, the induction method is adopted to gradually transform from specific to abstraction to form a theory. In contrast to quantitative research, qualitative research is based on founded theory. The theory formed in this way comes from the interconnection between much different evidence collected, which is a bottom-up process.

3.2.2 Case study method

The researchers choose one or more scenarios as objects, systematically collect data and information, and conduct in-depth research to explore the situation of a phenomenon in the actual living environment. It is suitable for answering research questions such as "how to change", "why did it become like this" and "what the result" when the boundary between the phenomenon is unclear and the actual environment is not easy to distinguish, or the researchers are unable to design accurate, direct, and systematically controlled variables. At the same time, it includes unique design logic, specific data collection and unique data analysis methods. Field observation behavior can be used, and information can also be obtained through research documents. The research is more qualitative and has characteristics in data collection and analysis, including relying on multiple sources of evidence. Different data and evidence must be able to converge in the form of triangulation and get the same conclusion. There are usually pre-developed theoretical propositions or problem definitions to guide the direction of data collection and the focus of data analysis, focusing on the inspection of events at that time, not intervening in the control of events, which can preserve the integrity of life events and discover meaningful characteristics. Compared with other

research methods, if you can make a thick description and systematic understanding of the case, grasp the dynamic interaction process and the context of the situation, you can get a more comprehensive and holistic view.

3.2.3 Analogies

Analogy is a method of cognitive thinking and speculation. It is to classify and compare unknown or uncertain objects with known objects, and then speculate about unknown or uncertain objects. If the unknown object does have more similarities with a known other party, then the analogy has a certain cognitive value, and taxonomy evolved from the analogy. From a certain attribute of a class of things, it can be inferred that things like them should also have such attributes. The conclusion must be tested experimentally. The more attributes common to the analogy objects, the greater the reliability of the analogy conclusion.

Compared with other thinking methods, analogy is a parallel thinking method. Either way, the analogy should be carried out between the same level. Aristotle pointed out in the Pre-Analysis: “The analogy does not represent the relationship between part to the whole, nor the relationship between the whole and the part.” Analogous reasoning is a kind of periplectic reasoning, and the premise may not be true. To improve the reliability of analogy conclusions, it is necessary to identify the similarities between objects as much as possible. The more similarities, the greater the reliability of the conclusion, because the more similarities between the objects, the greater the relationship between the two, and the more reliable the conclusion. Conversely, the less reliable the conclusion will be. In addition, it should be noted that the same situation on which the analogy premise is based should be essential to the situation of the introduction.

4 Finding and Conclusion

The main direction of this study is environmental ecology and the social nature of educational technology Relationships to open the impact of the environment on technology management, dredge the science, technology, and the inherent thinking paradigm of education associated with the environment. Education Environment is the beginning of everyone's exposure to technology. As a transformation channel of science and technology, education technology is to undertake the middle axis between the top and the bottom, shouldering tasks such as technology combing, problem decomposition, and content upload channel construction. Environmental innovation、 Product Experience and technology Application, It's all life and education. Foundations at the primary experience of environmental nurturing, As well as Practice test Taxi Adaptive process.

4.1. The Birth of Hybrid Space

We say that "knowledge changes ability, methods change fate", and the way you really learn how to do it in life is more important than just a little knowledge. And a certain law that we infer after accumulating experience in life is defined as "science" by future generations. Learning science is the learning of the above-mentioned methods, which can be continued and developed in anyone and can move forward all the time. For example, you learned some basic mathematical knowledge in elementary school, studied geometry in junior high school, and you learned geometry. You can learn and inherit the knowledge written by Euclid a few years ago. If you are a mathematical genius, you can add some theorems to him to make geometry more perfect, and later people can continue to introduce new theorems on your basis, so that a science of geometry has been developing and the times are moving forward at any time.

4.1.1 The bridging of the current fragmentation plate by 4DU ecology.

It has been many years since the research of educational knowledge. The technical enlightenment inheritance of book knowledge has not restored the basic operation experience. In addition, mechanical intelligence, robotics, programming technology, etc. can no longer get the germination of students' creativity through classroom abstract description. Life practice experience, the practical inquiry learning ecology led by the creator center and the science and technology museum. As shown in Figure 4.1 below, approach effectively improve finish the learner's original experience, obtain supplementary resources other than teaching. 1. The community environment nurtures hobbies; 2. The activity center focuses on technology and structure; 3. The research center focuses on design and product experience; 4. Finally, there is the Urban Science and Technology Museum, which describes the history of science and technology and the historical background of technology.

We use 0 Arrive 1 to express the emergence of creativity. Heal the above 4 scene technology frame creativity of inclusion, the formation of its inner exploration enlightenment, The action that leads to curiosity is consistent, so that it bridges the difference. Technique, Teaching thinking training Evolution and innovation, projection technical experience It is made by thousands of 0 Arrive 1 as butterfly turned around.

Figure 4.1 4DU multi-environmental technology innovation scene

4.1.2 Offline environmental integration

Mixed learning scenarios, comprehensive practice research, study, Project topic Learning give branch of learning mixed, equipped with technology in the contextuality-scene application, give way the subject curriculum began to move from differentiation to integration. It uses educational evaluation technology, Resource technology, big data technology, learning technology is the core, take information technology as Carriers, achieve scientific education, and maximize the effectiveness of education.

The social science and technology innovation environment is K-12 In addition to the insufficient technical ability of the school, the supply and demand sides are gradually opened under the cultivation of the market. As shown in Figure 4.2 below: The green line is the incremental flow of technology, and the red line is the flow direction of teaching clothing products. From the perspective of science and technology innovation, the increasing green technology also shows the characteristics of students' technical needs from bottom to high. The learning organization flow service diagram describes the path, technical process and talent interaction route of learning needs and social communication.

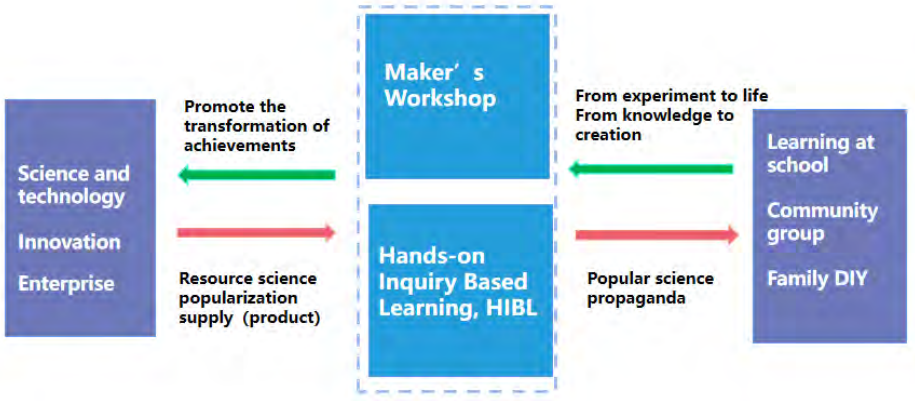

Figure 4.2 New scenario elements under the market mechanism

4.1.3 Online content construction

Solve the teaching relationship, content digitization, experimental data, simulation model and online experience, and establish the evidence-based practice cognition from OMO (Online-Merge Offline) deep learning to hybrid learning. To realize the basic experience operation, the previous scientific creation and enlightenment teaching scenarios have met the curiosity needs of some students, which can make up for the pure memory dilemma of subject learning. However, with the growth of age and cognition because the limitations of software and hardware equipment and technical capabilities in the original learning scene tend to be single, and the professional fields of teachers are different, higher-level technical guidance is needed as an auxiliary to continuously meet students' continuation of work innovation and market testing and obtain advanced experience and creative inspiration. (Zhang, 2018).

Taking scientific and technological innovation research as an example, through the completion of work design, workshop creative materialization, product deconstruction, including life applications, etc., the cooperation and support of different technical majors are needed. The guidance of professional tutors can be continuous improvement and in-depth learning.

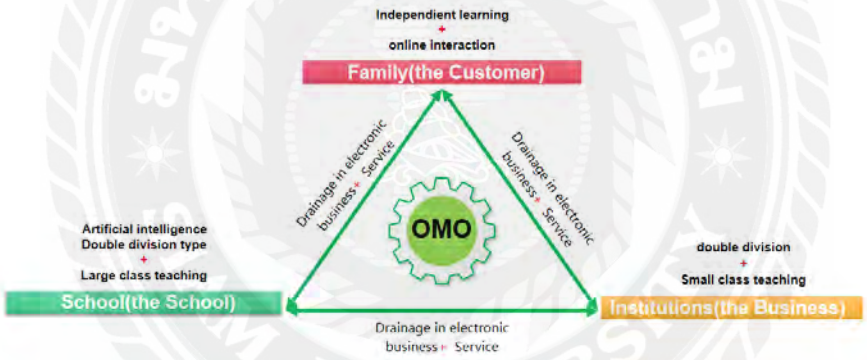

Figure 4.3 Online and offline service relationship

What we need to do is to protect and cultivate this continuous positive momentum, complement mixed learning mechanisms that lack environmental support, and build educational identity. As shown in Figure 4.3, in terms of course content experimental data, work process recording, knowledge migration, research and evaluation, a hierarchical and gradual deconstruction channel is built.

4.2. Finding an attractive deeper learning map

Learning is not a one-sided process. Study (HIBL) Education will start the personal experience of exploring science and technology, improve the memory training of school education knowledge, and solve real-life problems in the real world. The combination of deep learning and practice will become the new normal of our educational life.

Many schools and out-of-school alliances are also changing, including in some countries. Parents' voices are one of the reasons for the change, and the disruptive impact of new technologies is another. Before letting the children start exploring, the teacher will offer some basic and simple introductory courses. These courses are suitable for children to learn and easy for them to accept. This can prevent them from being frustrated at the beginning. But teachers will still set a high goal for them, hoping to stimulate their potential and keep them moving forward.

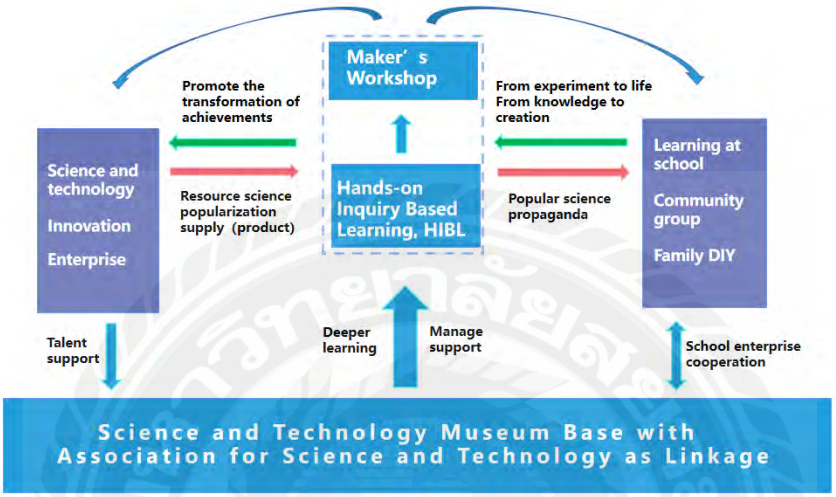

Figure 4.4 Partner system construction

Build a new vision of enterprise science and technology museums, as shown in Figure 4.4, promote the flow of service talents and technical talents, plan business investment, and mobilize the management relationship of market organizations. Educational units or individuals have always been users of the system, and only investment in corporate behavior can create service output.

4.3. Conclusion

1. In the face of diverse natural and social environments, after comparing the ecological scene. With integrated and modular physical space 4DU Ecological structure, with the characteristics of sustainable growth and common science and innovation enlightenment education. Public facilities such as science and technology museums and theme museums at the municipal level in proportion to the population are a good supplement to scientific and technological publicity and urban cultural memory; there are many shops in our surrounding communities or shopping malls. Do-it-yourself Activity room, science and technology activity center, small group students in a classroom. Teaching some scientific exploration or technical enlightenment; There is also a large thematic research center with more distinctive natural advantages and

scientific and technological equipment, feeling AR, VR, 3DAnd the exhibition and operation experience of intelligent machines, and experience the past and present life of science and technology. Gather 4DU was from hand-on inquiry based learning, multiple environmental and social resources will contribute to the aggregation and formation of new learning organizations.

2. Schools are no longer the only resource of the learning environment. Invest in operation and management investment to realize upstream and downstream, online and offline joint service formats. Technique filled in the low-lying technology. Maximize complete and Change Go to educational ecology, educate out of the ivory tower, and return to life experience, Knowledge mastery begins to move from purpose to means. From the mixed learning attention to the environment, it is found that with the expansion of the scale of urban construction, the operation scenarios for science and technology innovation have greatly increased, becoming the best practical training experience area for primary and secondary school children.

There is room for reform in the current education system. In the second stage of offline education market integration, it is necessary to rely on investment and financing to build a science and technology museum for private enterprises to form a preliminary organizational form of systematic thinking. Take the Science and Technology Museum as the leader and the Alliance of Science and Technology Associations as the investment institution to find support and management relationships for the system cycle.

5 Recommendation

Create a favorable learning environment Learning to become, stimulate the search for new information and evidence, and learn to grow in the ecology of science and technology innovation. Lifelong learning society, there are scientific and technological innovation ecological fertile soil around you to support each other. It will no longer matter what school you graduate from and what diploma you have. What matters is important is what you have learned, what kind of knowledge structure do you have, and only when you can innovate the future. To get close to this goal, we will review and summarize the problems analyzed in this article.

First, Developing educational technological present like many MOC (My Own Creation). Relying on the Intelligent Technology Expert Committee, we could build an open and socialized scientific and technological innovation practice platform for students. Go out of campus and use research practice to transform knowledge into life, introduce the latest scientific research trends and the creative combination of scientific research achievements, development and expansion, and research course project information package. Education originates from life and is applied to life, from small

classroom to social classroom, extending the topic alliance resources in science and technology museums and museums for visiting learning, competition organization and industrial incubation.

Second, the pursuit of social system education with Innovative and Mutual Aid Element Universe Platform Research of Customer Community. Through the innovation consortium platform, we can share the knowledge and wisdom of institutions and professionals such as internal and off-campus development, scientific research institutes, science, and technology associations, and provide guidance and scientific guidance support for diversity originating in the community. Combined with the support of digital and intelligent education technology, the innovative consortium is not subject to geographical restrictions and segment restrictions. It has changed from single school section OMO education to multi-study WEB3.0 joint education.

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