

# Study on the Construction Mechanism of Public-Private-Partnership (PPP) Training for Talent Qualification Certification in Environmental Literacy Education

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## ABSTRACT

The implementation mechanism of environmental education has long-term benefits in promoting environmental policies and is the trend of promoting environmental education in the world. To address the background and current trends of environmental education development, the content of environmental literacy, practical roles, certification of environmental education professionals, and assessment indicators should be integrated, a third sector should be introduced to participate in the environmental education mechanism, and specific recommendations should be made to implement action measures using Kirkpatrick Model. This study suggests multi-level measures to promote environmental education, including the establishment of a certification body for environmental educators, certification training for environmental educators, training for volunteer cultivation, planning of teaching materials and curricula, cultivation model programs, etc. Besides, government agencies, social organizations (third sector), educational institutions, enterprises, etc. should be combined to join the platform of environmental education cultivation mechanism.

**Keywords:** *Environmental Literacy (EL); Kirkpatrick Model; Public-Private-Partnership (PPP); The Third Sector*

## 1. INTRODUCTION

Environmental education in the twenty-first century will have to lead citizens to face the various crises arising from rapid environmental changes, to understand the truth about environmental problems, and to reflect on the responsibility and awareness of environmental ethics. Therefore, it is the key mission of this era to provide environmental education training institutions and facilities with environmental education personnel and professional qualifications, to provide environmental management and conservation-related teaching institutions with a full range of environmental education personnel knowledge training and degree certification, and to unify the content of the knowledge curriculum and the training mechanism for sustainable improvement. This paper focuses on the opportunity to create an education and training base for environmental literacy in the Greater Bay Area of China, with a view to bringing in the third sector of social organization resources and

building a sustainable training mechanism and a platform for environmental education and training.

## 2. WORLD TRENDS IN ENVIRONMENTAL EDUCATION

Beginning in the mid-1980s, global environmental policies expanded rapidly, as evidenced by the number of countries that established environmental ministries, environmental legislation, environmental impact assessment systems, and national environmental planning. From the mid-1980s to the end of the 20th century, environmental policies expanded rapidly across the globe. To date, most national-level regions around the world have established environmental protection administrations and corresponding environmental systems, such as Northern Europe, the United States, etc., notwithstanding the greatly varied capacity and content; China has in recent years launched mass patriotic sanitation campaigns and afforestation, greening of land

to enhance soil transformation to prevent soil erosion, active transformations of old cities, planned construction of new industrial and mining areas, etc. Besides, it proposed to maintain and improve the human environment, and successively introduced a number of environmental and economic policies in recent years, such as the beautiful countryside (2013), environmental education (2015), rural revitalization plan (2018-2022), etc. Japan has also promoted the implementation of environmental education.

### **3. BACKGROUND AND PRESENT STATUS OF ENVIRONMENTAL EDUCATION DEVELOPMENT**

#### ***3.1. Global Environmental Issues for the Coming Age of Climate Extremes***

Global warming and climate change have been the focus of international attention for nearly 30 years, with the United Nations Intergovernmental Panel on Climate Change (IPCC) declaring at the 12th meeting of Working Group I of the Fifth Climate Change Assessment Report that “human impacts are extremely likely to be the main cause of global warming since the mid-20th century, with a probability of more than 95 percent.” (IPCC AR5, 2013). [1]

“Declaration on the Human Environment” proposed by the United States was adopted by the plenary session of the United Nations Conference on the Human Environment in 1972, with seven common views and twenty-six principles. Suffice it to say that in recent times, the world mostly believes that social environmental literacy must be upgraded in terms of thinking and become an important trend in environmental education for the world’s citizens.

#### ***3.2. Reflection on “Economic Development” and “Environmental Values”***

Moral education in the 21st century needs to lead all levels of society and students to face these environmental crises and pay attention to environmental ethics, to understand the core of environmental destruction and extreme climate problems, to make all citizens reflect on the responsibility of environmental ethics in climate literacy, and to have the basic knowledge of environmental sustainability.

#### ***3.3. The Hidden Dangers of Environmental Literacy Enhancement for Human Society***

The international public opinion on environmental education law is strong, and the public’s call for environmental education legislation is also high. China has also placed ecological civilization at a strategic level in its overall layout, and the development of

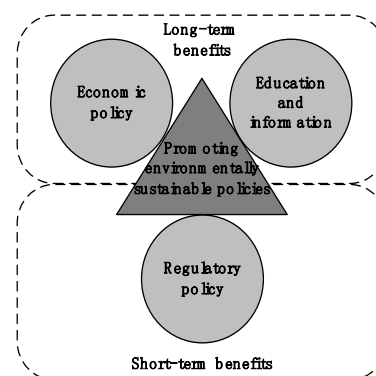
environmental education legislation is a concrete practice to implement the central government’s plan to strengthen the construction of the ecological civilization system.

Generally speaking, regulatory policies and economic instruments can directly influence behavior; regulatory policies are faster and more direct, but difficult to fundamentally change the perceptions and attitudes of actors, while education and information policies, although slow in action, will have a long-term impact on improving environmental literacy through educational cultivation channels and provide a strong opportunity to practice environmental education legislation.

### **4. LONG-TERM BENEFITS OF ENVIRONMENTAL EDUCATION IN PROMOTING ENVIRONMENTAL POLICY**

The overall trend of advanced environmental education in the world is to set up promotion mechanisms and experimental bases for environmental educators in multiple ways, such as facilities, institutions, certification of environmental educators, volunteer training, teaching materials, training programs, etc. For sites, they are open to applications from educational institutions and public and private institutions to join the cultivation mechanism. For the diversity of different environments, combined with sightseeing, leisure, and learning functions, they attract public participation to achieve the effect of education and entertainment

There are specific policy declarations, legislation, and the establishment of dedicated management agencies to implement environmental policies in three main directions (see Figure 1): (i) regulatory policies: traditionally a top-down approach, mainly by setting environmental standards to constrain the behaviour of management targets; (ii) economic policy: mainly through market instruments to stimulate the target to change their behaviour; (iii) education and information policy: promote objects to be more environmentally friendly through moral sense and public opinion pressure.



**Figure 1** Concept of benefits of policy mechanisms to promote environmental sustainability

(1) “Regulatory policies” and “economic policies” can directly influence behaviour, with “regulatory policies” having faster and more immediate short-term effects, but it is difficult to fundamentally change the perceptions and attitudes of actors.

(2) “Education and information” and “economic policy” have long-lasting effects, although they work slowly.

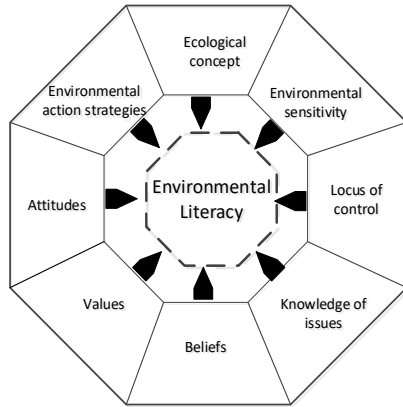


Figure 2 Environmental Literacy Concept

Source: Hungerford, Peyton, Tomera, Litherland, Ramsey, & Volk (1985) [2]

#### 4.1 Environmental Literacy and Environmental Education

Environmental Literacy (EL) has been named and defined by scholars in different fields, such as “environmental/ecological awareness”, “environmental/ecological literacy”, “new environmental paradigm”, “environmental/ecological behaviour”, “environmental/ecological attitude”, and “environmental/ecological concern” [2]. The definitions also reflect different perspectives on knowledge, emotional traits, value beliefs, and action styles. However, the connotation is the same, as they all reflect people’s views on the relationship between individuals and nature and their initiatives to participate in ecological and environmental issues. It originates in the late 1960s [3] when the concept of “environmental literacy education” was introduced in 1968 by Charles E. Roth, an American scholar, who believed that strengthening environmental education could help to develop environmentally literate citizens as a basis for solving the ecological dilemmas faced by human beings [4].

Regarding the classification of environmental literacy: (1) From the perspective of psychological attitude, environmental literacy is classified as “environmental knowledge”, “cognitive process of environmental problems” and “emotional intention towards the environment”. (2) From the scope of environmental interests, environmental literacy is divided into different levels such as “self-interest center”,

“human interest center” and “ecological interest center”. (3) From conceptual to practical orientation, environmental literacy is classified into different levels such as “nominal”, “functional”, and “operational”.

Hungerford, Peyton, Tomera, Litherland, Ramsey, & Volk et al. (1985) and Volk, T., Hungerford, H., & Tomera, A. (1984) [2][10] hold that the environmental literacy included in climate literacy and environmental ethics should have eight directions, including (1) Ecological Concept; (2) Environmental Sensitivity; (3) Locus of Control; (4) Knowledge of Issues; (5) Beliefs; (6) Values; (7) Attitudes; (8) Environmental Action Strategies) (Figure 2).

#### 4.2 The Role of Environmental Education Practice in Each Sector

The purpose of “environmental education” is to improve the comprehensive literacy of the environment, including moral and ethical literacy, development of abilities and personality, and healthy physical and mental development. The contents covered are cultural literacy, technological literacy, mental health literacy, moral literacy, etiquette literacy, physical education, activity class literacy, environmental education, safety education, and legal education.

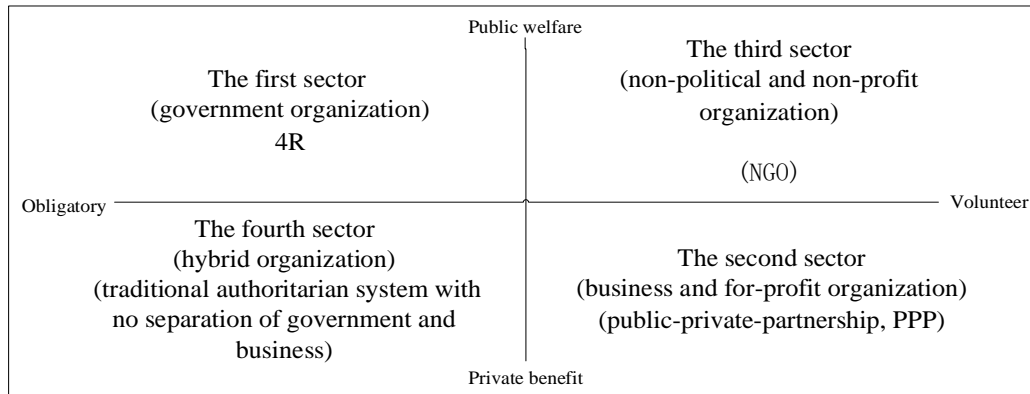
In terms of the organizational role of various sectors of society, environmental education can play different functions, and in terms of its public welfare and voluntary attributes, it is divided into the first to fourth sectors (see Figure 3). The explanation is as follows: [6]

(1) The first sector is the public sector; the public sector is the sector of the economy that is owned and operated by the government rather than by private businesses or individuals.

(2) The second sector is the private sector; the private sector is the economic part of institutions and organizations that are not directly controlled or operated by the government.

(3) The third sector is common such as social welfare institutions, non-governmental organizations, volunteer organizations, charitable organizations, etc. It usually refers to those organizations whose purpose is to serve the public, not for profit, whose income is not for the personal gain of any individual, and which have their own legal tax-exempt status and legal status of providing tax deductions to donors.

(4) The fourth sector (hybrid organization): Usually there are social enterprises, public welfare enterprises, and other forms of emergence at the same time with profit and social responsibility, not to maximize the interests of shareholders as the core, merging more social responsibility, in solving social problems, and not a person, but with the advantages of each sector.



**Figure 3** Participation of each department in the construction of environmental education and training cultivation and certification methods

### 4.3 Multisectoral Establishment of Environmental Education and Training Mechanism

#### 4.3.1 Introduction of third sector participation in environmental education mechanisms

Environmental education as a social public requires a large number of human resources and non-profit organizations to participate in it, and it is suitable for third sector organizations to invest in it and assist the implementation of environmental education together with government departments. In modern societies around the world, there are a large number of public affairs management activities, and although the government is the core subject of these management activities, there are many public services and products, and many third sectors must be involved in addition to the government [7].

The government has never provided and cannot provide all the services. The third sector is different from governmental organizations (first sector) and profit-making organizations (second sector), and the third sector is a general term for various non-governmental and non-profit organizations, which can mainly emphasize the values of personal dedication and mutual benefit of members, and has important characteristics such as non-profit, civic, autonomous, voluntary, non-political and non-religious [8].

#### 4.3.2 Training Environmental Education Professionals Certification

In the era of the knowledge economy, human resource training is a necessary process to enhance learning literacy. Environmental education personnel must be built by the first sector (government units) to ensure the reliability and correctness of the environmental education training process by establishing a training mechanism

using the Kirkpatrick model training quality as a measurement and management tool. In this study, environmental education needs to be established by the “Certification Training Evaluation Model” and “Certification Training Program Evaluation Indicators” as follows.

(1) Environmental Education “Certification Training Evaluation Model” (4R)

“Certification Training Evaluation” is a systematic investigation, analysis, and review of teaching activities according to certain criteria during or after the certification training period, to study and determine the value of the certification training and the performance of the organization from the viewpoint of effectiveness.

Through the training quality system, environmental education institutions are guided to establish a standardized training system platform to facilitate the planning and implementation of environmental literacy training programs, so that the professional fields of education units and individuals are closely integrated with the development goals of environmental policies and to improve the overall quality of environmental education and training.

Donald Kirkpatrick, former professor emeritus at the University of Wisconsin, first published the model in 1959. The work was updated in 1975 and the most famous work, *Evaluating Training Programs*, was published in 1993. Each successive level of the model represents a more accurate measure of the effectiveness of the training program [9]. Each level can be viewed in more detail and explore how to apply the “Certification Training Evaluation Orientation” with different emphases, and the most commonly used evaluation model, the Kirkpatrick Model, is listed here. The four levels of the model are Reaction, Learning, Behavior, and Result, in that order [8].

The difficulty, time required, and depth of information for these four levels of assessment are

proportional to the level of assessment. In particular, the “result level” is the most difficult to evaluate in the four levels. The reason for this is that there are many factors that affect organizational effectiveness, and it is

impossible to clearly identify the factors that cause organizational effectiveness to improve, which may be caused by the effectiveness of training, other factors, and the degree of relationship and interaction between them.

**Table 1.** 2 Main elements, functions, and measurement of model assessment in Kirkpatrick model

Model Evaluation	Content	Function Description	Measurement Method
Reaction	To assess the satisfaction of the trainees	This refers to the participants’ perception of the overall training program, i.e., their overall satisfaction with the implementation of the training, including the content of the training program, instructors, training equipment, teaching materials, administrative support and services, and suggestions for improvement of the training course.	Assessment by questionnaire, observation method, etc. The timing of the assessment can be at the end of the training, weeks to months after the end of the training.
Learning	To determine the degree of learning acquisition of trainees	Trainees change their attitudes, improve their knowledge or increase their skills through the training program. The learning level measures the degree of understanding and knowledge absorption of the trainees at the end of the training course, that is, the degree of professional knowledge and skills that the trainees can learn from the training course, and the degree of self-confidence and improvement of work attitude to understand how to test the effectiveness of the training.	Written tests, oral examinations, classroom performance, and other ways to review the measurement, the results of the measurement can show the effect of training, the results of the analysis will help the training unit to understand the strengths and weaknesses of the training program, in order to serve as the basis for future training course revision and adjustment.
Behavior	To examine the degree of knowledge application of the trainee	To assess whether trainees are able to transfer their learning to work after training and whether the training has changed their behavior, i.e., to assess changes in their work attitudes and behaviors after the training.	This is done after a period of time after the training is completed, and the training results are tested after a period of time has elapsed so that the trainees have sufficient time to apply the new knowledge and skills they have learned in the workplace.
Result	To calculate the economic benefits generated by the training	To evaluate the specific contribution that trainees can provide to the organization after training in order to explore the effect of training on organizational performance.	The assessment can be done by comparing relevant information before and after training.

(2) Evaluation indicators for certification training programs

Kirkpatrick points out that for a certification training program to be effective, it must basically belong to the three aspects of certification training program planning, implementation, and evaluation in the “planning and

running time” and can be used as indicators for the evaluation of the certification training program.

The following 10 indicators should be noted, including: (1) the decision of certification training needs; (2) the setting of certification training objectives; (3) the development of specific orientation of certification training objectives; (4) the selection of participants; (5)

the decision of the best course duration; (6) the selection of appropriate learning facilities and venues; (7) the selection of appropriate instructors; (8) the selection and preparation of supporting aids; (9) the integration of the certification training program; (10) the evaluation of the program.

Indicators (1)-(9) are mainly related to the evaluation of the implementation process to understand the effectiveness of the certification training program during the planning and operation time and are mainly assessed by the planning and execution of the certification training program and the administrative staff. Indicator 10 emphasizes the importance of evaluating the certification training program, covering all possible impacts.

## 5 CONCLUSIONS

It is important for the society as a whole to start cultivating the foundation of moral education for environmental literacy in response to the times and extreme climate change, and it is an opportunity and responsibility to promote the development of environmental education through the joint construction of a multi-faceted promotion mechanism by multi-sectoral players.

The specific proposed action measures for implementation are as follows.

(1) Survey and planning of environmental education human resources demand analysis.

(2) Integrating environmental education human resource knowledge and curriculum design of teaching materials.

(3) Nurturing environmental education human resources degree certification and implementation units.

(4) Introducing social organizations and social capital to participate in the PPP model to promote environmental education.

(5) Constructing a mechanism to foster sustainable improvement in environmental education

In response to the needs of social and environmental changes, we have established a sustainable mechanism to plan the training and certification of environmental education human resources cultivation needs by combining the Talent Quality Management System (TTQS) with a continuous improvement approach. In addition, we will work together with various departments to establish the goal of human resource training for environmental education projects and promote environmental sustainability.

## AUTHORS' CONTRIBUTIONS

Shyng, J. H. designed research, performed research, analyzed data, and wrote the paper.

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