Comparative Study of Environmental Education Systems in Elementary Schools in China and Japan

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Abstract
This study undertakes a comparative analysis of the environmental education system in elementary schools in China and Japan. We first compared the elementary school system, including school years, subjects and teaching hours of both countries. We found that Japan and China's elementary education systems share essential subjects such as Language, Mathematics, Science, and Moral Education, and both lack a subject of environment. The second section examines the national environmental education policies. Japan's environmental education policies are systematic and consistent, integrated into the curriculum since 1998, with continuous improvements for sustainability. China has rapidly advanced its environmental education since 2003. Finally, we compared both countries' national environmental education guidelines and found that they have similar objectives but different teaching approaches. China treats environmental education as part of school education, focusing on shaping students' mindsets. Japan, however, emphasizes practical learning in each subject to prepare students for contributing to future environmental sustainability. The detailed information about both countries' environmental education systems in this paper may also help other countries improve their systems.

Keywords: Environmental Education, Comparative Analysis, Elementary School, Japan, China

Introduction

Amid escalating global environmental crises, countries prioritize sustainable development. China and Japan, as influential nations in East Asia, face pressing challenges. China struggles with severe air pollution and is the largest greenhouse gas emitter (Cheng et al., 2021). Japan deals with waste management and marine pollution, notably from the Fukushima Daiichi nuclear power plant (Guo et al., 2022). These pressures emphasize fostering early environmental awareness through education.

Empirical research demonstrates that Japanese elementary school students exhibit significantly higher levels of pro-environmental behavior than Chinese students. This discrepancy is largely attributed to Japan's emphasis on experiential learning, outdoor activities, and cultural values that promote harmony with nature (Liu & Kaida, 2024). Such approaches are deeply integrated into Japan's educational and societal frameworks, fostering greater environmental responsibility among students. While both nations recognize the importance of environmental education, variations in implementation and pedagogy lead to differing outcomes. Japan's experiential and culturally immersive model effectively cultivates pro-environmental behaviors, offering valuable insights for global environmental education (Kodama, 2016; Liu & Kaida, 2024).

This paper aims to examine the differences and similarities in environmental education at the elementary school level in China and Japan. By conducting a comparative analysis of their environmental education guidelines, the study seeks to identify key differences that may contribute to Japan's environmental education's effectiveness and provide references that can be used for the development of environmental education curricula in Chinese elementary schools. The detailed information about both countries' environmental education systems in this paper may also help other countries improve their systems.

This paper includes three main parts: a comparison of the elementary school systems of China and Japan, an analysis of their national environmental education policies, and an exploration of differences in their education guidelines.

Elementary School System in China and Japan

China and Japan's elementary education systems prioritize comprehensive student development, reflecting cultural values and national policy goals through structured curricula and region-specific adaptations (Kodama, 2016; Wang, 2020).

Elementary School System in China

China's elementary education system operates under a centralized framework led by the Ministry of Education (MoE), which is responsible for formulating national policies, establishing curriculum standards, and overseeing educational reforms. Figure 1 explains the structure of China's elementary education system. The MoE ensures uniformity in educational quality and content across the country, setting guidelines for subjects such as Chinese, mathematics, science, and moral education. At the provincial, municipal, and county levels, local education departments are crucial in adapting national instructions to implement education properly and meet regional and local needs. These departments manage school administration, teacher recruitment, and resource allocation, ensuring that national policies are effectively implemented at the grassroots level.

Schools, as the elementary execution units, must follow the national curriculum while incorporating region-specific elements to address local cultural and social contexts. The MoE retains authority over textbook design, teacher certification, and educational assessments, while local governments oversee infrastructure, teacher placement, and student welfare. This tiered structure seeks to balance national standardization with localized flexibility, promoting equitable and inclusive access to quality education across diverse regions (Wang, 2020; Zhang & Liu, 2022).

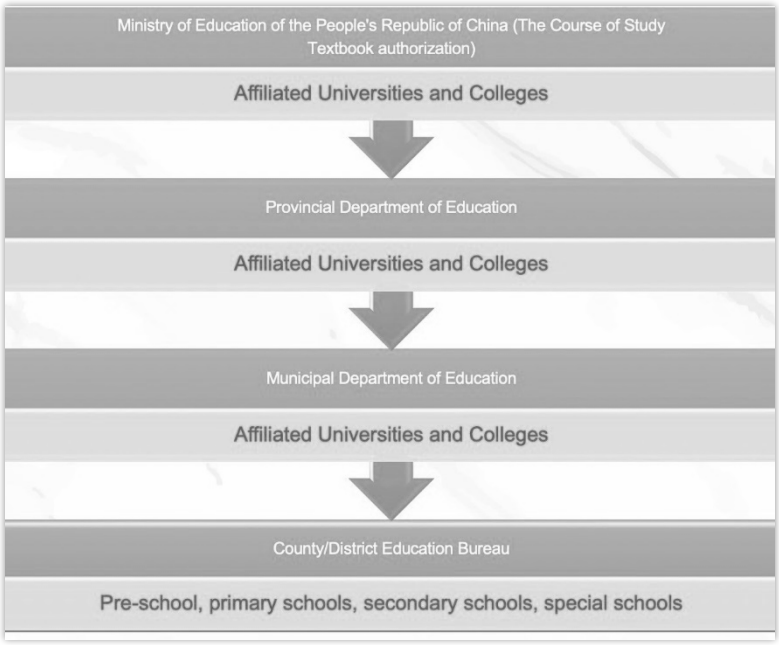


Figure 1: Elementary Education System in China

In China, elementary school textbooks are produced by various publishers, including the People's Education Press (PEP), local education bureaus, and regional publishers such as Shanghai Education Publishing House, Beijing Normal University Press, Jiangsu Education Press, and Guangdong Education Press. These localized editions reflect regional educational priorities and cultural characteristics. However, since 2019, subjects such as Chinese, Moral and Legal Education, and Physical Education have adopted nationally unified textbooks to ensure consistency and standardization across the country (Ministry of Education of the People’s Republic of China, 2019). This reform aims to reduce regional disparities, enhance the quality of basic education, and promote educational equity.

Table 1: Arrangement the Total Class Hours for Each Subject Over Nine Years in China

<table>
<tr><td></td><td colspan="9">Grade</td><td>Total class hours in nine years (%)</td></tr>
<tr><td></td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td></td></tr>
<tr><td rowspan="12">National Curriculum</td><td colspan="9">Morality and Law</td><td>6%–8%</td></tr>
<tr><td colspan="9">Chinese</td><td>20%–22%</td></tr>
<tr><td colspan="9">Mathematics</td><td>13%–15%</td></tr>
<tr><td></td><td></td><td colspan="7">English</td><td>6%–8%</td></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td></td><td colspan="3">History and Geography</td><td>3%–4%</td></tr>
<tr><td colspan="6">Science</td><td colspan="3">Physics, Chemistry, Biology(or Science)</td><td>8%–10%</td></tr>
<tr><td></td><td></td><td colspan="6">Information Technology</td><td></td><td>1%–3%</td></tr>
<tr><td colspan="9">PE & & Health</td><td>10%–11%</td></tr>
<tr><td colspan="9">Art</td><td>9%-11%</td></tr>
<tr><td colspan="9">Labor</td><td>14%-18%</td></tr>
<tr><td colspan="9">Comprehensive Practical Activities</td><td></td></tr>
<tr><td>Local Curriculum</td><td colspan="9">Designed and planned by provincial education departments</td><td></td></tr>
<tr><td>School-Based Curriculum</td><td colspan="9">Determined by individual schools</td><td></td></tr>
<tr><td>Weekly Hours</td><td>26</td><td>26</td><td>30</td><td>30</td><td>30</td><td>30</td><td>34</td><td>34</td><td>34</td><td></td></tr>
<tr><td>Total Course Hours</td><td>910</td><td>910</td><td>1050</td><td>1050</td><td>1050</td><td>1050</td><td>1190</td><td>1190</td><td>1122</td><td>9522</td></tr>
</table>

(*Source: Adapted from Ministry of Education and translated by the authors*)

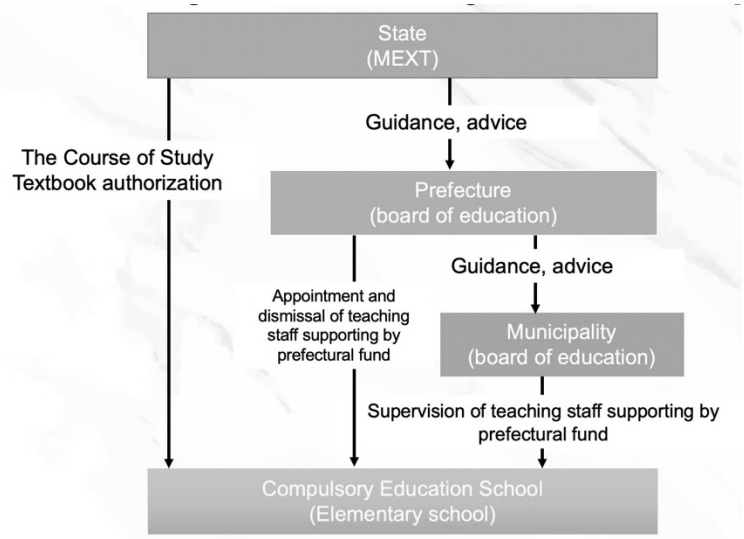
The MoE's 2022 curriculum plan specifies elementary school class hours. details the curriculum structure and class hours for elementary and secondary education in China. Elementary school (grades 1-6) includes core subjects: Chinese, Mathematics, and Moral and Legal Education, making up a major portion of total hours. Chinese comprise the largest share (20%-22%), followed by Mathematics (13%-15%) and Moral and Legal Education (6%-8%). Physical Education and Health (10%-11%) and Arts (9%-11%) are also included and emphasized.

Science is introduced in grade 3 and gradually increases in complexity. Foreign Language (6%- 8%) begins in grade 3, while Information Technology (1%- 3%) is included in grade 4. Comprehensive Practical Activities and Labor courses are integrated across grades. Provincial education authorities and schools allocate local and school-based courses in addition to the national curriculum, accounting for 14% to 18% of total hours.

Elementary School System in Japan

Japan’s elementary education system is renowned for its structured and highly coordinated administration, ensuring consistency and quality across regions. This well-organized system reflects the nation’s commitment to fostering equal educational opportunities for all students.

Figure 2 illustrates the structure of Japan's elementary education system, highlighting the roles of different administrative levels. At the top, the Ministry of Education, Culture, Sports, Science, and Technology (MEXT) establishes national policies, authorizes textbooks, and defines the Course of Study. MEXT also provides guidance and advice to prefectural boards of education, which oversee regional educational administration. Prefectures manage the appointment and dismissal of teaching staff, which is funded by the prefectural budget.



(*Source: Adapted from National Institute of Educational Policy Research*)

Figure 2: Elementary Education System in Japan

Municipal boards of education operate under the guidance of prefectures, supervising teaching staff and managing the day-to-day operations of compulsory education schools. This hierarchical structure ensures that national educational policies are effectively implemented locally, maintaining consistency while allowing for regional adaptation. The collaboration between state, prefectural, and municipal authorities reflect Japan's commitment to high-quality, standardized education across the country .

The 2021 Education Curriculum Department meeting set standard class hours for Japanese elementary school subjects. Table 2 shows the instructional hour distribution across six years. Japanese has the highest allocation, starting at 306 hours in first grade and decreasing to 175 hours by fifth and sixth grades. Mathematics remains at 175 hours from third grade onward, emphasizing numeracy.

Social Studies and Science begin in the third year, with their hours gradually increasing as students progress. Physical Education and Music are consistently included throughout all six years, although their hours decrease slightly in the upper grades. "Life Studies" is emphasized in the first two years but is gradually phased out afterward.

Moral Education and Special Activities have set hours across all grades, promoting character development and extracurricular participation. Home Economics starts in the fifth year, and Integrated Studies begins in the third year for interdisciplinary support.

Foreign Language Activities occur in the third and fourth grades, leading to formal Foreign Language classes in the fifth and sixth grades. Annual instructional hours steadily rise, reaching 1,015 by the fourth year and remaining consistent through the sixth grade.

Table 2: Standard Teaching Hours for Elementary Schools in Japan

Subject	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6
Japanese	306	315	245	245	175	175
Social Studies	——	——	70	90	105	105
Mathematics	136	175	175	175	175	175
Science	——	——	90	105	105	105
Life Studies	102	105	——	——	——	——
Music	68	70	60	60	50	50
Art	68	70	60	60	50	50
Home	——	——	——	——	60	55
PE	102	105	105	105	90	90
Special Subject: Morality	34	35	35	35	35	35
Special Activities	34	35	35	35	35	35
Integrated Learning Time	——	——	70	70	70	70
Foreign Language Activities	——	——	35	35	——	——
English	——	——	——	——	70	70
Total	850	910	980	1015	1015	1015

(*Source: Adapted from Ministry of Education, Culture, Sports, Science and Technology and translated by the authors*)

Comparison of the Elementary Education Systems of China and Japan

Japan and China's elementary education systems share essential subjects such as Language, Mathematics, Science, and Moral Education. Both countries emphasize comprehensive development through Physical Education and the Arts. More could be compared in detail as for their subjects and time allocation, but one important finding from this paper's perspective is that both countries don't have a subject called "environment" or a subject that could be directly interpreted as environment-related subject.

However, this does not mean they don't implement environmental education. They both have National Environmental Education Guidelines. The following sections will compare the national environmental education policies and selected guidelines from both countries in elementary schools.

The Environmental Education Policy in Elementary Schools in China and Japan

In this chapter, we will review the national environmental education policy in elementary schools in both countries.

Environmental Education Japan

Since 1947, Ministry of Education of Japan, now Ministry of Education, Science, and Culture (MEXT), has meticulously and systematically developed school educational guidelines. These foundational documents, known as the Gakushū Shidō Yōryō (Curriculum Guidelines), have provided detailed frameworks for all subjects, supported by explanatory notes to ensure consistent application nationwide. Revised approximately every ten years, these guidelines evolve to reflect changing societal and educational priorities, maintaining their relevance in a

rapidly transforming world. All versions can be found on the website of the National Institute for Educational Policy Research.

The Japanese government took actions on environmental education in a quite early time. The first environmental education materials for elementary schools were published in 1992 and in the revision Curriculum Guidelines for elementary schools in 1998 (Heisei 10) revision, environmental education was formally incorporated to curriculum. Specifically, it encouraged learning about environmental issues during periods such as Integrated Studies to raise awareness about environmental problems. Before this, topics related to the environment were covered in natural sciences and life studies, but it was not until the 1998 revision that environmental education became a systematic theme within the curriculum guidelines. Following this revision, the 2008 curriculum revision further strengthened environmental education, and today, it is a crucial theme aimed at realizing a sustainable society. The latest revision of primary school Curriculum Guidelines was issued in H29 (2017), and the environmental education in each subject is summarized on the website of MEXT. A new version of environmental education materials is provided by the same National Institute for Educational Policy Research in 2016.

Environmental Education in China

The Ministry of Education issued the 2003 Implementation Guide for Environmental Education in Schools and published the related announcement and document on its official website. This marked the beginning of the formal integration of environmental education into the national curriculum. This guide was pivotal in creating a structured framework for incorporating environmental topics into the curriculum across grade levels. It emphasized three core aspects: emotional engagement, practical processes and methods, and knowledge and skills, ensuring a holistic approach to fostering ecological awareness among students.

In 2022, the Ministry of Education introduced the Implementation Plan for a Green and Low-Carbon Education System. This plan built upon earlier initiatives by emphasizing environmentally sustainable practices, such as carbon reduction and green lifestyles, to prepare students for challenges in a sustainable future. Furthermore, in 2023, the Opinions on Strengthening Science Education in Schools reinforced environmental education by promoting scientific approaches to sustainability, aligning with national goals of innovation and ecological responsibility. These documents are very brief but also available on the official website of the Ministry of Education of the People's Republic of China.

In conclusion, Japan has methodically integrated environmental education into its curriculum since 1998, persistently refining it to foster sustainability. Conversely, China formally introduced environmental education into its national curriculum in 2003 and has achieved significant advancements since then.

Comparison of the National Environmental Education Guidelines of China and Japan

The 2007 Environmental Education Instructional Materials in Japan and the 2003 Guidelines in China were chosen for their foundational roles in shaping environmental education. These key documents highlight each country's historical progress and strategic approaches to integrating environmental education into their curricula.

Overview of Document Contents

Japan's document includes four chapters, along with references, and stretches across 106 pages. The four chapters are structured as below:

- Chapter 1: Environmental Education and Environmental Issues
- Chapter 2: Environmental Education in Elementary Schools
- Chapter 3: Practical Examples of Environmental Education in Schools
- Chapter 4: References

Chapter 1 outlines the importance of environmental education and discusses various perspectives on the topic. In Chapter 2, it emphasizes practicality by offering clear guidance on incorporating environmental education into every discipline. Chapter 3 presents case studies and implementation strategies, providing actionable insights for educators to apply theoretical knowledge in the classroom setting effectively. Chapter 4 details the document references, serving as a gateway for thorough exploration.

China's document comprises five chapters and totals 26 pages, focusing on building a structured framework for environmental education. The five chapters are structured as below:

- Chapter 1: Background and Environmental Issues
- Chapter 2: Definition and Objectives of Environmental Education
- Chapter 3: Learning Content
- Chapter 4: Teaching Strategies
- Chapter 5: Evaluation Suggestions

The document starts with Chapter 1, which covers global and domestic trends, their significance, and the basic principles of environmental education. Chapter 2 outlines its goals, focusing on emotional engagement, processes and methods, and knowledge for sustainability. Chapter 3 details the learning content across emotional, methodological, and knowledge-based areas with activity suggestions. Chapter 4 provides practical guidance on implementation, emphasizing hands-on and locally relevant activities. Finally, Chapter 5 focuses on evaluation methods to assess and improve the effectiveness of environmental education in schools.

This illustrates Japan's emphasis on detailed and actionable content within more extensive documents, whereas China provides concise guidance that can be adapted to local contexts' needs. Japan integrates environmental education into practical applications, while China emphasizes a broad framework. These differences highlight each country's educational priorities and provide complementary strategies for environmental education.

Objectives of Environmental Education

Japan's document defines the objectives of environmental education as:

> Having an interest in and knowledge about the environment and environmental issues, based on a comprehensive understanding and recognition of the relationship between human activities and the environment. It aims to equip individuals with the skills and critical thinking needed to take desirable actions for environmental conservation, develop the ability to make judgments, and actively participate in creating a sustainable society. Ultimately, it fosters attitudes and behaviors that take responsibility for the environment. (P.9)

China's document defines the objectives of environmental education as:

> The objective is to guide students in recognizing environmental issues that pertain to their families, communities, nations, and the global context. This initiative emphasizes the importance of understanding the interdependent relationships between society and nature, thereby facilitating acquiring knowledge and skills necessary for meaningful interaction with the environment. Additionally, it cultivates feelings, attitudes, and values that are advantageous to environmental stewardship, encouraging students to engage actively in decisions and actions related to sustainable development, ultimately shaping them into socially responsible citizens with practical capabilities. (P.5)

Japan's environmental education fosters interest, knowledge, and critical thinking to encourage responsible actions for environmental conservation and active participation in building a sustainable society. China's environmental education emphasizes understanding global and local environmental issues, cultivating values for environmental stewardship, and encouraging socially responsible actions for sustainable development.

Approaches of Environmental Education

The 2003 Guidelines in China provide a framework for implementing environmental education in Chinese primary schools in Chapter 3. It details objectives and activities for different grade levels and highlights three core aspects: emotional engagement, processes and methods, and knowledge and skills. These three aspects are structured as below:

- Emotional Engagement, Attitudes, and Values
  - Focuses on fostering respect and empathy for nature.
  - Encourages activities like observing natural phenomena, listening to nature sounds, and role-playing as animals or plants.
- Processes and Methods
  - Emphasizes developing problem-solving skills.
  - Includes identifying local environmental issues, conducting sensory observations, and proposing solutions in group discussions.
- Knowledge and Skills
  - Natural Ecosystems: Understanding ecological processes, biodiversity, and environmental interactions.
  - Social Life: Exploring the relationship between human activities and environmental sustainability.
  - Economy and Technology: Analyzing the impact of resource use and technological advancements on the environment.
  - Participation and Decision-Making: Encouraging active involvement in environmental protection and sustainable development initiatives.

Additionally, the document offers content and guidance on teaching activities for grades 1 through 6, ensuring a structured and age-appropriate approach to environmental education. Here, we use the first aspect, "emotional engagement, attitudes, and values," as an example (Table 3). This underscores the importance of cultivating students' respect for nature and various life forms. Engaging in activities such as observing natural phenomena, listening to natural sounds, and reading poetry focused on the environment facilitates a deeper connection with nature. Additionally, role-playing as animals or plants within a balanced ecosystem promotes empathy and a sense of responsibility towards the natural world.

Table 3: Emotional Engagement and Activity Suggestions in Environmental Education (Grades 1–6)

Content and Requirements	Activity Suggestions
Appreciate nature's beauty and respect living organisms' right to exist.	Experience sunrises, sunsets, blue skies, fluffy clouds, winding rivers, and birdsong. Listen to flowing water... Write poems to celebrate nature's beauty and embrace harmony with it. Adopt a plant or animal and enjoy thriving alongside living beings.
Respect and care for others, treating them kindly while sharing joy and happiness together.	Use topics like "If I were..." to explore the needs of diverse ethnic, social, and economic groups. Organize activities, like creating a poster for "A Harmonious 2010."
Acknowledge and honor the varying needs while promoting a simple and eco-friendly lifestyle.	Recognize when needs differ, such as distinguishing necessities from luxuries in life. Determine what is essential versus non-essential.
Respect and recognize the cultural diversity of various peoples and explore methods to preserve and appreciate nature.	Engage with communities to appreciate their unique cultures. Recognize cultural traditions and explore the links between culture and nature.
Recognize your environmental rights and responsibilities; actively engage in school and community initiatives to protect the environment and assess behaviors that impact the environment.	Explore environmental protection systems and regulations. Grasp the importance of environmental rights and responsibilities. Organize school recycling campaigns or join community cleanups.

(*Source: Adapted from Ministry of Education and translated by the authors*)

Japan, similar to China, highlights the significance of skills and mindsets in environmental education, although its framework is less comprehensive than China's guidelines. Here are the abilities and attitudes emphasized in the document:

- Abilities
  - Identifying Issues: Engage with and identify environmental issues proactively.
  - Planning: Create plans from observations and experiments to address issues.
  - Inference: Inferring cause-and-effect relationships through problem-solving and data analysis
  - Utilizing Information: The ability to gather and analyze information on environmental issues and communicate effective findings.
- Attitudes
  - Forming and Expressing Opinions: The approach of forming and sharing personal opinions while respecting and understanding others' perspectives.
  - Making Fair Judgments: A comprehensive and objective mindset towards environmental issues, emphasizing fairness and responsibility.
  - Active Participation: Engaging in environmental protection, exchanging ideas, and participating in practical activities and solutions.

These abilities and attitudes form the foundational skills required for environmental education, which are further complemented by the six key perspectives that provide a structured framework for understanding and addressing environmental issues. These perspectives are structured in detail as below:

- Cycles
  - Emphasizes the interconnected flow of materials and energy in the natural world, aiming to develop awareness of sustainable resource use and waste reduction.

- Diversity
  - Highlights the variety of organisms, energy sources, and ecosystems on Earth, encouraging respect for biodiversity and an understanding of its critical role in maintaining ecological balance.
- Ecosystems
  - Focuses on the relationships and interdependence among living organisms, their physical environment, and human activities, promoting an understanding of ecosystem dynamics.
- Symbiosis
  - Encourages coexistence and mutual support between humans and the environment, fostering actions that contribute to sustainable living.
- Finiteness
  - Draws attention to the limited nature of Earth's resources, urging careful use and conservation to prevent resource depletion.
- Preservation
  - Stresses the importance of protecting natural environments and ecosystems, encouraging active efforts to maintain biodiversity and ecological health.

The document delineates comprehensive requirements for environmental education across all subjects, guided by six distinct perspectives, thereby ensuring thorough integration throughout the curriculum. In this context, we utilize the Science as a pertinent example to illustrate how Japan integrates the six environmental perspectives into its curriculum. (Table 4)

For instance, the "cycles" perspective is addressed through topics such as the movement of water in nature and the human body's structure. "symbiosis" is explored through lessons on the interaction between plants, animals, and their environment, while "diversity" emphasizes seasonal changes and the variety of life forms. The "finiteness" perspective examines the limitations of resources like air and fuel, and "preservation" focuses on conserving ecosystems and water. Finally, the "continuity of life" is highlighted through teachings on plant growth, reproduction, and the lifecycle of living organisms. This structured integration demonstrates how Science in Japan holistically incorporates sustainability principles.

Table 4: Environmental Perspectives in Japanese Science Education

Examples of Science Learning Content	Examples of Perspectives on Understanding the Environment
Seasons and Living Things , Structure of the Human Body, Heat Retention, Combustion and Air, The Behavior of Water in Nature, Functions of Flowing Water	Circulation
The Growth of plants and insects, Seasons and the habitats of living organisms, Life and Environment of Organisms	Coexistence
Seasons and Organisms, The Living Environments of Organisms, The Functions of Flowing Water	Diversity
Living organisms and the Environment Functions of Electricity and Light, Combustion and Air, Effect of Current,	Finiteness
Living organisms and the environment, The Functions of Flowing Water	Conservation
The Growth of plants and insects, Seasons and the habitats of living organisms, Life and Environment of Organisms, Plant Germination, Growth, and Fruiting,	Respect for life
The Growth of plants and insects, Plant Germination, Growth, and Fruiting, The birth of man and fish	The continuity of life

(*Source: Adapted from Ministry of Education, Culture, Sports, Science and Technology and translated by the authors*)

For instance, the "cycles" perspective is addressed through topics such as the movement of water in nature and the human body's structure. "symbiosis" is explored through lessons on the interaction between plants, animals, and their environment, while "diversity" emphasizes seasonal changes and the variety of life forms. The "finiteness" perspective examines the limitations of resources like air and fuel, and "preservation" focuses on conserving ecosystems and water. Finally, the "continuity of life" is highlighted through teachings on plant growth, reproduction, and the lifecycle of living organisms. This structured integration demonstrates how Science in Japan holistically incorporates sustainability principles.

Comparison of Distinctive Features in Environmental Education

In Japan, environmental education is woven into specific subjects with clear and practical teaching suggestions. This approach is highly structured, with key themes like "cycles," "diversity," and "symbiosis" integrated into lessons across various disciplines. The goal is to help students connect theoretical concepts with real-life examples, encouraging them to think critically and actively address environmental issues. However, the way these guidelines are implemented often varies depending on the resources available and how individual schools interpret them.

China takes a different approach, focusing on a broader framework emphasizing emotional connection, practical skills, and basic environmental knowledge. The guidelines encourage

schools to design activities suited to local conditions, with a gradual progression tailored to different grade levels. This flexibility allows schools to address specific environmental challenges while promoting respect for nature and sustainable values. However, differences in regional resources and school capacities mean that actual practices often diverge from the overall framework.

Conclusion

This paper presents a comparative analysis of the environmental education systems in elementary schools in China and Japan. It examines the differences in both countries' school structures, national policies, and educational guidelines. The study highlights similarities in foundational subjects and objectives but identifies distinct approaches to implementing and integrating environmental education into the curriculum.

The main contribution of this study is its detailed comparison of China and Japan’s environmental education systems, offering insights into their respective strengths. China’s approach emphasizes cultivating emotional engagement, skills, and knowledge within a structured and clearly defined framework. In contrast, Japan provides specific, detailed guidance for cross-disciplinary teaching, integrating environmental education into each subject area with clear instructions. These findings provide valuable perspectives for other countries aiming to improve or establish their environmental education frameworks.

Future research could focus on exploring how these differing guidelines are practically integrated into specific subjects. Such studies could provide valuable insights into their effectiveness and reveal how subject-level implementation influences students' environmental understanding and engagement.

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