

Research on the Content Production of Academic Journal WeChat Official Account Participating in Science Popularization

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Abstract

Taking 27 academic journals of the discipline of "environmental science", which were included as the core of Peking University in 2017 and 2020, as the research object, this paper investigates the content production of the academic journal WeChat official account in science popularization. The content types of WeChat official account of academic journals of "environmental science" discipline participating in science popularization can be classified into 9 categories. According to the maturity attributes (novelty vs maturity) and professionalism attributes (simplicity vs complexity) of popular science content, it is divided into two dimensions: disciplinary field review and prospect, and science briefing content that is both novel and complex; Industry trends and news, technology commendations, popular science knowledge, and reader perspectives are novel but simple in popular science content; The popular science content of scientific research stories is mature and simple; The promotion of science and technology and methods, as well as the popularization of environmental governance systems, are mature and complex.

Keywords

Academic Journals; WeChat Official Account; Popularization of Science; Content Production.

1. Introduction

According to the Science and Technology Popularization Law of the People's Republic of China (hereinafter referred to as the Science Popularization Law), science and technology popularization (hereinafter referred to as science popularization) refers to the activities of the state and society to popularize scientific and technological knowledge, advocate scientific methods, disseminate scientific ideas, and promote scientific spirit. The relationship between academic journals and popular science cannot be ignored. Firstly, according to the Science Popularization Law, science popularization is a social responsibility of the entire society in China, and naturally one of the social responsibilities of academic journals^[1]. Secondly, the popularization of academic papers helps to enrich the volume of popular science resources, enhance the scientific literacy of citizens, and feed back technological innovation, meeting the utilitarian goals of popular science^[2]. Again, academic journals reporting on the latest research findings or technological discoveries can inform the public about the forefront of technological development, thereby preparing the public for participating in discussions on technological issues and meeting the non utilitarian goals of science popularization^[3]. Once again, with the refinement of scientific division of labor, scientists also need to understand the forefront of development in other disciplines in order to facilitate cross innovation. In other words, scientists also need to accept popular science^[3]. In addition, the new methods, experiments, and concepts elaborated in academic journal papers can also affect human thinking patterns and

play a role in popularizing science. Finally, adding popular science content to academic journals is beneficial for expanding their influence^[2].

Considering that the environmental protection department is one of the departments that should focus on promoting science popularization^[4], the main results of the 2018 China Citizen Science Literacy Survey also show that the most interesting scientific and technological information for the public is cutting-edge scientific knowledge in environmental pollution and governance (85.10%)^[5]. The study focuses on 27 academic journals in the "Environmental Science" discipline, which are also included in the 2017 and 2020 editions of Peking University. This paper investigates the content production of academic journals' WeChat official account participation in science popularization, with a view to analyzing the status quo of content production of academic journals' participation in science popularization at a higher level, and thinking about countermeasures. This research will have a strong theoretical and practical guiding significance for academic journals' participation in science popularization.

2. Content Production of Academic Journal WeChat Official Account Participating in Science Popularization

The WeChat official account of the academic journal of "environmental science" can be classified into nine types of content for science popularization, which are: review and prospect of discipline fields, scientific briefings, promotion of science and technology and methods, industry trends and news, scientific and technological commendation, environmental governance system, science popularization knowledge, scientific research stories and reader views.

2.1. Disciplinary Field Review and Prospect Sub-section Headings

The review and prospect of disciplinary fields can help readers understand current research hotspots, achieved research and development progress, existing knowledge gaps, and future research directions. For example, on November 13, 2020, the WeChat official account of Environmental Engineering pushed "148 hot spots and emerging frontiers in 11 fields! Is there your research direction?".

2.2. Scientific Briefing

Scientific briefing content is a way for academic journals to reconcile public reading habits while maintaining the professional attributes of the content, and expand the scope of scientific knowledge inclusion in academic journals. Platforms represented by WeChat, Weibo, and short video applications are the main platforms for academic journals to push scientific briefing^[6].

From the perspective of the research and development teams that promote the content of scientific briefings, the focus is mainly on promoting the academic achievements of domestic scholars published in domestic and foreign journals; From the initial publication time of the content recommended by the scientific bulletin, there are both published articles and articles published in the journal (such as the "article recommendation" column on the WeChat official account of the Journal of Ecotoxicology); From the perspective of the authors of scientific briefings, there are both journal editors and trustworthy scholars. The writing methods of scientific briefings are diverse, such as "abstract & QR code scanning of the original text", "abstract & excerpt from the original text", "abstract & research results & conclusion", "editor's note & article information & article highlights & content guidance", etc., fully reflecting the balance between content simplification and professionalism.

2.3. The Promotion of Science and Technology and Methods

In the 1950s, the concept of "popularization of science and technology" first appeared in the Japanese White Paper on Science and Technology. It initially included two meanings, referring

to the industrial application of advanced science and technology, as well as the deeply ingrained way of thinking and life in science^[7]. The science and technology and method promotion content here fully reflects the main ideas of these two aspects.

The science popularization content of science and technology and method promotion in the WeChat official account of Water Treatment Technology and Environmental Engineering is relatively rich, which not only introduces new processes and shares experience in solving problems, but also focuses on knowledge and technology promotion of common reagents and equipment. The popular science content of science and technology and method promotion not only involves the industrial application of advanced science and technology, but also involves the application of scientific thinking methods and scientific research methods. For example, the article "Expert opinion | Zhou Xiaochuan: two institutional issues in the process of moving towards" carbon neutrality "in the WeChat official account of Environmental Engineering on May 19, 2021.

2.4. Industry Dynamics and News

Industry trends and news related popular science content mainly cover three aspects. First, news reports on academic conferences within the big science organization system; second, reports on the technological development trends of enterprises in the industry (such as the tweet on Industrial Water Treatment's WeChat official account on June 13, 2021 "The largest sewage treatment plant built at one time in China will become a 'photovoltaic power plant'"); third, industry information, including industry layout and development ideas, the industry's scientific and technological development (such as the report of the article "China's top ten scientific and technological development of ecological environment in 2020 will be released, and the sewage treatment concept plant for the future will be selected" on the WeChat official account of Industrial Water Treatment on June 7, 2021), etc.

2.5. Technology Commendation

Since the 1970s, the Japanese Science and Technology White Paper has included recognition in the concept of "popularization of science and technology". From 1982 to 1989, the Japanese Science and Technology White Paper has also included rewarding inventions in the concept of "popularization of science and technology", indicating that recognition and rewarding inventions have become an important component of science and technology popularization^[7]. The Science Popularization Law of our country also includes recognition and rewards in legal provisions. Article 29 of the Science Popularization Law clearly stipulates that people's governments at all levels, science and technology associations, and relevant units should support science popularization workers in carrying out science popularization work, and organizations and individuals who have made important contributions in science popularization work should be commended and rewarded. For example, on the WeChat official account of Environmental Engineering, on January 4, 2021, the article "Announce the award-winning projects of 2020 Environmental Protection Science and Technology Award" was published.

2.6. Environmental Governance System

According to the theory of multicenter governance, there are many decision-making centers in the environmental governance system, including central government units, local government units, government derived entities, non-governmental organizations, private institutions, and individual citizens. Under certain rules and constraints, they jointly exercise the subjective power of environmental protection in various forms^[8].

The content of environmental governance system science popularization mainly covers five aspects. First, the exercise of power by the government and government derived entities includes not only the formulation, implementation and governance achievements of policies

and systems, such as the article "Guiding Opinions on Promoting the Development of Ecological Environmental Volunteer Service" published by the Ministry of Ecological Environment and the Central Civilization Office on June 4, 2021 on the WeChat official account of Environmental Science Research, but also the publicity of environmental protection concepts to the public, For example, the article on the WeChat official account of Environmental Science Research on June 27, 2021, "Popularization of environmental protection science | Join with 'Xiaoshan' and 'Xiaoshui' to participate in the plastic restriction and reduction action!". The second is the environmental governance suggestions and interpretations of relevant policies and systems from the big science organizations represented by scholars to the government departments, such as the article "Expert interpretation | Interpretation of Guiding Opinions on Promoting the Development of Ecological Environmental Volunteer Service" on the WeChat official account of Environmental Science Research on June 4, 2021. Third, citizens' individual decision-making behavior, such as the article "Come and praise your favorite public participation cases and the most beautiful ecological and environmental protection volunteers" on the WeChat official account of Marine Environmental Science on May 6, 2020. The fourth is the implementation and announcement of relevant environmental governance rules and regulations, such as the short article "Environmental Engineering" on June 2, 2021, which states that these environmental regulations and standards will officially come into effect from June 1. The fifth is to publish relevant environmental governance rules and regulations, such as the short article "Ten Rules for Citizens | Video version of Citizen Ecological Environmental Code of Conduct (Trial)" on the WeChat official account of Environmental Science Research on June 26, 2021. The first three aspects are related to the exercise of power by multiple decision-making centers, while the last two aspects are related to the rules and regulations on which the environment relies for governance.

2.7. Science Popularization Knowledge

The science popularization content of small knowledge mainly covers five aspects. The first is the popularization of academic skills, such as the "Graduation Record of Science Xiaoying" series of content pushed by the WeChat official account of the Journal of Agricultural Environmental Sciences in May and June 2021. Second, knowledge and science popularization on hot topics of science and technology, such as the article "20 insights into future scientific and technological development trends, many of which are related to ecological environment" on the WeChat official account of Environmental Engineering on May 30, 2021. Third, knowledge and science popularization on hot policy topics, such as the article "Carbon sink, carbon quota, carbon trading, CCUS, CCER, carbon knowledge" on the WeChat official account of Environmental Engineering on May 5, 2021. Fourth, knowledge and science popularization on hot topics of people's livelihood, such as the article "Immortals' collective salvation? Keep this urban waterlogging science popularization!" on the WeChat official account of Environmental Engineering on August 13, 2020. Fifthly, knowledge and science popularization on ecological environment topics, such as the article on the WeChat official account of Environmental Engineering on November 14, 2020, "Reject light pollution, let the beautiful stars stay forever, and six places in China have been included in the 'World Dark Night Protected Area List'".

2.8. Scientific Research Stories

The science popularization content of scientific research stories mainly covers five aspects. First, scientific research stories describing the process of scientific research, such as the article "frontline report on Qinghai Tibet soil scientific research" series on the WeChat official account of Ecology and Rural Environment on August 16, 2020. The second is a scientific research story that describes the scientific research concept, such as the article "Expert appointment | Talking about the foresight of research and development" in the WeChat official account 2021.5.25 of Water Treatment Technology. Third, scientific research stories describing the psychological

health status of researchers, such as the article "Researchers always feel tired because of the repeated crisis?" on the WeChat official account of Ecology and Rural Environment on July 4, 2020. The fourth is a scientific research story that describes the academic history of scientists, such as the article on the WeChat official account of Ecology and Rural Environment on May 14, 2020, "High Mountain Uprising | 'Father of Modern Ecology' - George Evelyn Hutchinson". The fifth is a scientific research story that describes the history of the research process in a scientific research field, such as the article "Past and present life of anaerobic ammonium oxidation: exploration without end!" on the WeChat official account of Environmental Engineering on September 6, 2020.

2.9. Reader Views

The academic journal WeChat official account will also introduce readers' views to popularize science. The popular science content of readers' opinions covers environmental governance and industry development. For example, the article "Haze during the epidemic period: it was right to shut down the steel plant after changing rural coal into gas" on the WeChat official account of Environmental Science Research on February 13, 2020, and the article "Ecological significance of bats" on the WeChat official account of Ecology and Rural Environment on February 7, 2020, International hot topics such as the article "Illustration | How terrible is a million tons of nuclear sewage? Japan decided to discharge sewage into the sea yesterday | This operation is not the first time" on the WeChat official account of Industrial Water Treatment on April 10, 2021.

2.10. Summary

According to the maturity attributes (novelty vs maturity) and professionalism attributes (simplicity vs complexity), 9 types of popular science content can be divided from two dimensions. The maturity attribute represents the knowledge lifecycle stage in which popular science content is located, while the professionalism attribute represents the requirements of popular science content for professionalism or the reading qualifications of readers, that is, the professional knowledge and work experience that readers need to possess when reading popular science content. As shown in Figure 1, the maturity attribute is represented by the vertical axis, and the professionalism attribute is represented by the horizontal axis. The coordinate system is divided into four quadrants.

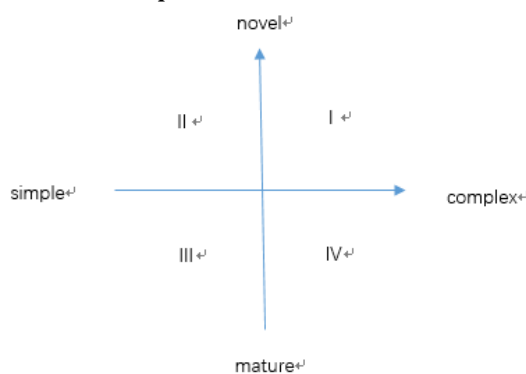


Figure 1: Types of Popular Science Content in Academic Journals

These 9 types of content belong to four quadrants: disciplinary field reviews and prospects, scientific briefings, and popular science content located in the I quadrant, which means that popular science content is novel and complex; Industry trends, news, technology commendations, popular science knowledge, and reader perspectives are located in the second quadrant of popular science content, which is novel but simple; The science popularization content of scientific research short stories is located in the third quadrant, which means that the science popularization content is mature and simple; The promotion of science and

technology and methods, as well as the environmental governance system, are located in the fourth quadrant, indicating that the content of science popularization is mature and complex.

3. Conclusion and Discussion

The content types of WeChat official account of academic journals of "environmental science" discipline participating in science popularization can be classified into 9 categories. According to the maturity attributes (novelty vs maturity) and professionalism attributes (simplicity vs complexity) of popular science content, it is divided into two dimensions: disciplinary field review and prospect, and science briefing content that is both novel and complex; Industry trends and news, technology commendations, popular science knowledge, and reader perspectives are novel but simple in popular science content; The popular science content of scientific research stories is mature and simple; The promotion of science and technology and methods, as well as the popularization of environmental governance systems, are mature and complex.

According to Article 16 of the Science Popularization Law, academic journals are also required to undertake an appropriate amount of scientific popularization work. Academic journals can seek ideas for opening up science popularization columns from the 9 types of science popularization content that participate in environmental science academic journals, thereby enriching the number and types of science popularization columns in each academic journal. The specific idea is as follows: first, divide the science popularization content according to the professional attribute of complexity/simplicity. Based on Figure 1, it can be seen that the review and outlook of disciplinary fields, scientific briefings, promotion of science and technology and methods, and environmental governance system science popularization content are classified as professional complexity, and then further divide the science popularization content classified as professional complexity according to the knowledge maturity attribute of novelty/maturity, The review and outlook of disciplinary fields, as well as scientific briefings, can be categorized as both complex and novel quadrants. By analogy, after clarifying the ideas, when planning science popularization columns, fill in the four quadrants shown in Figure 1 based on the characteristics of the discipline, and pay attention to the coordination and balance between multiple topic setters. This will easily achieve the enrichment of science popularization content types.

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