

Article

Cultivating Talents for Reporting Environmental News on China's Carbon Neutrality Policy

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Abstract: Reports on environmental news can guide public opinion and regulate stakeholders to take the initiative to save energy and reduce carbon emissions. With China's declared target of "carbon peaking and carbon neutral", specialized environmental journalism talents are needed, and a good environmental journalism curriculum reform evaluation system is essential. The Snowball sampling technique is adopted to survey respondents using a well-structured questionnaire. The questionnaire included four dimensions: course content, assessment methods, development planning, and teaching research. The experts' comments were quantified first, and then a three-level evaluation system was constructed using the Analytic Hierarchical Process. It was found that the content of the environmental journalism course on carbon peaking and carbon neutrality and the assessment methods for students were most valued by the experts and account for relatively large portions of the overall system. According to the scores of experts on the current situation of environmental journalism education with a double carbon theme in China, the course content and assessment methods need to be further improved compared with the career development planning of students and the teaching research of educators.

Keywords: carbon neutral; environmental news; energy policy; Analytic Hierarchical Process; China



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1. Introduction

1.1. Background

China is striving to achieve carbon peaking and carbon neutrality. Therefore, the construction of China's ecological civilization has shifted strategically with a focus on reducing carbon emissions [1]. Public opinion in the news is an effective social tool to regulate, guide, and supervise the stakeholders to reduce emissions. Thus, journalism, especially environmental journalism, might be able to contribute to carbon peaking and carbon neutrality [1]. However, in journalism education in Chinese universities, the focus on carbon neutrality and carbon peaking is insufficient [2]. The environmental journalism curriculum needs to be reformed to train professional journalists to report on carbon reduction [3]. It is crucial to develop a system for evaluating journalism curriculum reform in the context of the developmental assessment advocated by the Chinese government [4,5].

Many studies focused on public opinion that found a significant role in regulating and supervising companies' Environment, Society, and Governance (ESG) performance [6–9]. As a more formal and widespread communication, journalism occupies a crucial status in public opinion [10]. Positive or negative news coverage impacts a company's or industry's stock price or profit. Thus, micro-entities can take the initiative to reduce emissions due to news coverage and present a responsible social image [1,2]. In China, the unofficial We Media has developed rapidly, and the speed of information dissemination in society has become faster and timelier [10,11]. Distorted news sometimes leads to economic

fluctuations and increased uncertainty [10,12]. Consequently, a talent gap, the imbalance between the supply and demand for people to report truthful environmental news about carbon emission reduction, has emerged as China steadily develops its economy and reduces carbon emissions. Controlling the environmental emissions from the production system is necessary for sustainable development [13–16].

To fill the research gap, the universities might consider reforming the environmental journalism curricula and training professional talents [4,10,17]. However, it is unclear how and what that reform should look like. There is a lack of a scientific and reasonable evaluation system. The Chinese government requires universities to undertake student-centered, developmental education reforms [4]. However, in the past, the evaluation of curriculum reform has been contained with more or less subjectivity of individuals and lacks a quantitative and scientifically constructed approach [18]. This work is subjective and complex. This topic involves multiple criteria of approximately equal importance, and single-criteria models cannot meet the needs. Therefore, multi-criteria evaluation models will be adopted to help our analysis and decision-making. The Analytic Hierarchy Process (AHP) application has effectively bridged the gaps [19]. It has been used since the 1970s to the present day as an operations research method. It provides a facility for evaluating environmental journalism curriculum reform, a social problem lacking systematization and complex structure, which is difficult to quantify [4,17,18].

The use of the AHP for problematic exploration of curriculum reform evaluation has not been found in previous studies. Therefore, it is imperative to evaluate the system of environmental journalism education for developing specialized talents in the process of carbon emission reduction in China. Cleaner production is essential for industrial, agricultural, household, and service sectors [20,21]. The standardization, quantification, and systematization characteristics of AHP provide a scientific basis for evaluating China's environmental news curriculum reform [19]. The current study proposes a new system for evaluating educational reforms in environmental journalism driven by the goal of carbon neutrality to train counterpart talents. The paper is divided into five sections. The first section involves social background, problem formulation, innovations, and research value. The second section includes the process of investigation and data collection. The third and fourth sections are related to the research methodology, model design, results, and discussions. The fifth section summarizes the study's findings with policy implications.

1.2. Research Motivation and Contributions

Environmental news can regulate companies to make a green transition and thus contribute to China's carbon neutrality. However, there is a shortage of environmental journalism talents dedicated to carbon-neutral journalism in China. Moreover, there is a lack of a standard evaluation and guidance system. Therefore, the motivation of this study is to construct a set of indicators to guide and evaluate the cultivation of environmental journalism talents for carbon neutrality based on a survey of environmental journalism education experts through appropriate mathematical methods and to analyze the current situation in China.

There are two main contributions to this study. Firstly, the study emphasizes the guidance and evaluation system for cultivating environmental journalism talents with carbon-neutral themes and provides a development direction for cultivating environmental journalism talents in China. Secondly, a multi-criteria decision model (AHP method) is used to evaluate environmental journalism talent training.

2. Material and Methods

2.1. A process of Data Collection

In China, at least one institution focuses on building journalism and communication education in each province and municipality, and these institutions are supported by government funds [22]. These institutions represent the dominant discipline known for journalism in their regions [22]. This is the Chinese government's way of providing human

resources to improve the efficiency of regional journalism by building one university in each area with journalism as its strength to ensure the effectiveness of journalism communication in each region and the balance of development between them [22,23]. To ensure the comprehensiveness of the survey, we planned to interview one or two associate professors, professors, or experts of higher status in each province, municipality, autonomous region, and particular administrative area where journalism communication is a priority. However, due to China's pandemic (COVID-19) situation, we could only conduct interviews with 50 respondents. Therefore, the snowball sampling method was used for the survey. It is a more representative and comprehensive survey because it geographically covers approximately 80% of China. An approach of web-based questionnaires was adopted, and online interviews were conducted. We ensured respondents that their personal information, such as their names and Internet IPs, would not be disclosed at any stage. Table 1 describes the number of surveys from each region.

Table 1. The number of surveys from each region in China.

Type	Area	Quantity
Province	Hebei Province	2
	Shanxi Province (whose capital is Taiyuan)	2
	Liaoning Province	2
	Jilin Province	2
	Heilongjiang Province	1
	Jiangsu Province	2
	Zhejiang Province	2
	Anhui Province	2
	Fujian Province	2
	Jiangxi Province	2
	Shandong Province	2
	Henan Province	2
	Hubei Province	2
	Hunan Province	2
	Guangdong Province	2
	Hainan Province	1
	Sichuan Province	2
	Yunnan Province	2
	Shanxi Province (whose capital is Xian)	2
	Gansu Province	2
Autonomous Region	Inner Mongolia Autonomous Region	1
	Guangxi Zhuang Autonomous Region	2
	Ningxia Hui Autonomous Region	1
Municipality	Beijing Municipality	2
	Tianjin Municipality	2
	Shanghai Municipality	2
	Chongqing Municipality	2
Grand Total	27	50

A team of enumerators was organized. The enumerators were graduate students at various universities in China majoring in economics and management sciences. In 2022, enumerators interviewed experts in environmental journalism education to design dimensions to evaluate the environmental journalism curriculum reform under carbon-neutral requirements. A well-structured questionnaire was developed based on the experts' opinions [24–26]. All indicators of the questionnaire are divided into three levels. The relationship between the factors used in the questionnaire is shown in Table 2. For the

intuitiveness of the analysis, each factor was assigned a code name, indicated in parentheses after the name of each factor.

Table 2. Relationship between indicators.

Tier 1 Indicator	Tier 2 Indicator	Tier 3 Indicator
Course Content (F ₁)	Popularization of dual-carbon policy to students (F _{1,1})	Timeliness of policy explanation (F _{1,1,1}) The comprehensiveness of policy explanation (F _{1,1,2}) Depth of policy interpretation (F _{1,1,3}) Extension of policy interpretation (F _{1,1,4})
	Feedback from students on their understanding of the policy (F _{1,2})	The basic perception of policy understanding (F _{1,2,1}) Connection of policy and journalism (F _{1,2,2}) Expansion of knowledge of other related policies (F _{1,2,3}) Case-based and problem-based teaching models (F _{1,3,1})
	Self-motivated participation of students (F _{1,3})	“Dual-carbon + Media” interactive Q&A during class time (F _{1,3,2}) Flipped classes with the dual-carbon theme (F _{1,3,3}) Attendance of related courses (F _{2,1,1})
Appraisal method (F ₂)	Theoretical assessment (F _{2,1})	Completion quality of dual-carbon theme assignments (F _{2,1,2}) Reflective summary of the assignment (F _{2,1,3})
	Practical assessment (F _{2,2})	News writing and production on the topic of dual carbon policy (F _{2,2,1}) The practice of a dual-carbon theme with multiple communication tools (F _{2,2,2}) Participation in professional events on the theme of dual-carbon journalism (F _{2,2,3})
	Exploratory assessment (F _{2,3})	Dimensional assessment of the selection of carbon target (F _{2,3,1}) The assessment of the depth of the selected topic of the dual-carbon (F _{2,3,2})
	Cooperative assessment (F _{2,4})	Collaboration on interdisciplinary carbon theme in practice (F _{2,4,1}) The penetrating application of multiple media tools (F _{2,4,2}) Control of reporting strength and public opinion guidance (F _{3,1,1}) Construction of ideology and value (F _{3,1,2})
Career development planning (F ₃)	Code of Ethics and Professionalism (F _{3,1})	Popularization of news industry regulations and self-exemplification (F _{3,1,3}) Development of social responsibility for carbon reduction (F _{3,1,4})
	Information dissemination on the social employment gap of the dual-carbon target (F _{3,2})	The need for diversified competencies in “Media + Dual-carbon (F _{3,2,1}) Guidance on demand for talents with dual carbon themes from industry (F _{3,2,2})
	The practice of environmental journalism application (F _{3,3})	Content creation of dual-carbon policy news (F _{3,3,1}) Internship in traditional journalism positions (F _{3,3,2}) The practice of new media applications (F _{3,3,3}) The application of full-flow self-publishing media (F _{3,3,4})
Teaching research (F ₄)	Regional carbon emission reduction research and theoretical exploration at the site (F _{4,1})	University-resident integration and university feeding of the resident media industry (F _{4,1,1}) Local media development is driven by “production-study-research” drives (F _{4,1,2}) Construction of cross-cutting topics (F _{4,2,1})
	Collaboration of scholars from related cross-disciplines (F _{4,2})	The interpenetration of theories from different disciplines (F _{4,2,2}) Innovation and expansion of the journalism theory (F _{4,2,3})
	Interpreting the time-sensitive dual-carbon policy (F _{4,3})	A multi-dimensional interpretation of the dual-carbon target (F _{4,3,1}) The guidance of dual-carbon policy to research perspectives (F _{4,3,2}) Dual-teacher teaching with multidisciplinary integration (F _{4,4,1}) Classic case-based teaching on the topic of carbon reduction (F _{4,4,2}) Teaching with a combination of real and virtual scenarios (F _{4,4,3})
	Research on teaching methods of environmental news reporting (F _{4,4})	

A pilot survey was conducted on a few selected respondents to determine the authenticity of the questionnaire. According to their feedback, we improved the final questionnaire. From the beginning of March 2022, the enumerators conducted a final survey with the respondents. In addition, experts were invited to rate the current status of environmental journalism education reform in China [27]. The reasons for the results of the questionnaires completed by each expert were also asked. We analyzed the reasons in the Results and Discussion section in conjunction with the results of the AHP method.

2.2. Scale Values of Saaty

The key to applying AHP is the construction of the judgment matrix [19], and the experts’ judgments need to be quantified before constructing the matrix [19,28]. Saaty 1–9 scaling method was adopted, and the experts were invited to make a two-by-two comparison of the importance of the indicators at the same level [29]. The experts’ qualitative judgments were then quantified in increasing order of importance from value 1 to value 9 [29]. We averaged the scores of 50 experts for each indicator. Saaty relative importance rank was obtained by taking the mean difference in the scores based on the indicator system [30]. It is assumed that a_{ij} and a_{ik} are the means of the scores of any two indicators

at the same level. To construct the judgment matrix, the following is specified: if $0.25 < a_{ij}-a_{ik} \leq 0.50$, a_{ij} is slightly more important than a_{ik} , and the Saaty scale takes the value of 3; if $0.75 < a_{ij}-a_{ik} \leq 1.00$, a_{ij} is significantly more important than a_{ik} , and the Saaty scale takes the value of 5; if $1.25 < a_{ij}-a_{ik} \leq 1.50$. Then, a_{ij} is intensively more important than a_{ik} ; if $a_{ij}-a_{ik} \geq 1.75$, a_{ij} is extremely more important than a_{ik} and the Saaty scale takes the value of 9. If the difference is between the two scales, then the Saaty scale takes the values of 2, 4, 6, or 8, respectively [31]. The rule for quantification is shown in Table 3. This rule is used for all three levels of indicators.

Table 3. Scale values of Saaty 1–9 method.

Numerical Value	Meaning of the Options
1	Indicator i is as important as indicator j
3	Indicator i is slightly more important than indicator j
5	Indicator i is significantly more important than indicator j
7	Indicator i is intensively more important than indicator j
9	Indicator i is extremely more important than indicator j
2, 4, 6, 8	The middle values of 1–3, 3–5, 5–7 and 7–9
$a_{ji} = \frac{1}{a_{ij}}$	If a_{ij} denotes the importance of indicator i compared to indicator j , then a_{ji} is the importance of indicator j compared to indicator i .

3. Empirical Framework

3.1. Hierarchical Ordering

The single hierarchical ranking is considered a crucial step in the AHP. It is to determine the weights of the order of importance of numerous indicators under which a certain indicator belongs [32]. Let the judgment matrix be A . The eigenvalue of A , as well as the eigenvector, need to be calculated first. In other words, the process is solving the equation, $AX = \lambda_{max}X$, where λ_{max} is the maximum eigenvalue of A and X is the eigenvector corresponding to λ_{max} . In addition, it is necessary to assume here that X_i is the component of X , the value of the weight of the single ordering of the corresponding indicator [33].

The calculation procedure is given as: First of all, the column vectors of matrix A are normalized as in Equation (1).

$$\bar{a}_{ij} = \frac{a_{ij}}{\sum_{k=1}^n a_{kj}} \quad (i, j = 1, 2, 3, \dots, n) \quad (1)$$

where i and j denote not only indicators i and j but also the rows and columns of the judgment matrix A . \bar{a}_{ij} denotes the judgment matrix being normalized. Afterwards, the normalized aviatrices are summed by rows [34] as in Equation (2).

$$\bar{x}_i = \sum_{j=1}^n \bar{a}_{ij} \quad (i = 1, 2, 3, \dots, n) \quad (2)$$

where i and j denote the rows and columns of the judgment matrix A . \bar{x}_i shows the elements after summing according to the rows, which is a definite value. Column vectors are then obtained, as in Equation (3).

$$\bar{X} = [\bar{x}_1, \bar{x}_2, \bar{x}_3, \dots, \bar{x}_n]^T \quad (3)$$

The column vector \bar{X} is normalized by the process as in Equation (4) [35].

$$x_i = \frac{\bar{x}_i}{\sum_{i=1}^n \bar{x}_i} \quad (i = 1, 2, 3, \dots, n) \quad (4)$$

where x_i denotes the element obtained after the normalization process. Eventually, the desired feature vector X is obtained, as in Equation (5).

$$X = [x_1, x_2, x_3, \dots, x_n]^T \quad (5)$$

The maximum eigenvalues are obtained in Equation (6) [33].

$$\lambda_{\max} = \sum_{i=1}^n \frac{(AX)_i}{nX_i} \quad (i = 1, 2, 3, \dots, n) \quad (6)$$

3.2. Consistency Test

The consistency test must be done to judge the coordination of data from multiple nodes in the distributed system and avoid contradictory phenomena [36]. The consistency index can be measured with Equation (7) [36].

$$CI = \frac{\lambda_{\max} - n}{n - 1} \quad (7)$$

where CI denotes the value of the consistency index and n represents the order of the matrix. This case of $CI = 0$ indicates $\lambda_{\max} = n$ when the matrix A is judged to have perfect consistency, which is rare. However, the larger the value of CI , the worse the consistency of A [36].

To determine whether the consistency of the judgment matrix A meets our needs, the stochastic consistency ratio needs to be calculated [37] as given in Equation (8).

$$CR = \frac{CI}{RI} \quad (8)$$

where RI is the average stochastic consistency indicator of the same order, and its values are listed in Table 4 [37]. If $CR < 0.1$, then the consistency of the result is accepted; otherwise, the importance of the indicators needs to be adjusted [37].

Table 4. Correspondence between the value of RI and the order of the matrix.

Order of Matrix	1	2	3	4	5	6	7	8	9	...
Value of RI	0.00	0.00	0.58	0.90	1.12	1.24	1.32	1.41	1.45	...

4. Results and Discussion

4.1. Construction of Judgment Matrix

4.1.1. Judgment Matrix of the First-Level Indicators

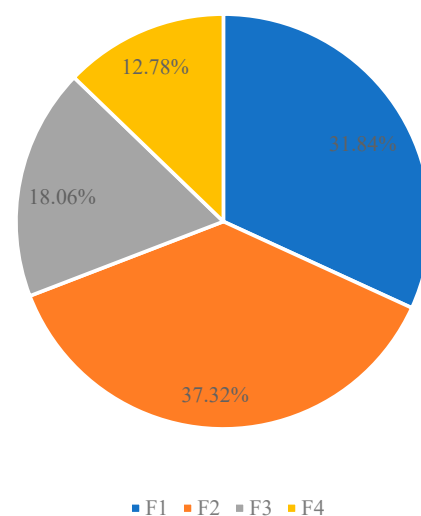
Four indicators, course content (F_1), assessment methods (F_2), students' career development planning (F_3), and teaching research (F_4), were elected in the first level of indicators. They are approximately four components of a course and a comprehensive perspective for commonly evaluating a course in China [38]. Table 5 shows the result of the judgment matrix, and their priorities are assessment methods, course content, students' career development planning, and teaching research. Their weights are 37.32%, 31.84%, 18.06%, and 12.78%. The consistency test coefficient CR of the judgment matrix is 0.018, which is less than 0.100, indicating that the matrix has stable consistency and is reliable [37].

Table 5. Judgment matrix of the first-level indicators.

Indicator	F ₁	F ₂	F ₃	F ₄	Weight
F ₁	1.000	0.927	1.920	2.191	0.3184
F ₂	1.078	1.000	2.631	2.575	0.3732
F ₃	0.521	0.380	1.000	1.886	0.1806
F ₄	0.456	0.388	0.530	1.000	0.1278
Test	$\lambda_{\max} = 4.047$, CI = 0.016, CR = 0.018				

The indicator assessment method has received the most attention from experts, similar to the findings of Neely-Sardon A. & Tignor M. [4]. In the past, paper-based exams were used habitually. However, it lacks practicality and creativity [35]. It may have been considered so stereotypical that it cannot make students transfer and apply their acquired professional knowledge. In the interviews, experts were interested in understanding more practical assessment methods. Rather than metaphysics, this will help students better adapt to social work.

Moreover, the course content was also considered relatively important. The cross-disciplinary theory of dual-carbon policy is taught mainly during class time. As in the study by Eva. G.-G. & José-Luis, M.-V. [39], the quality of the class time has always been a significant factor in evaluating a course, and it is no exception here [39]. Experts believe journalism educators should bring the concept of “dual-carbon policy” into their classes, as the media plays a key role in public opinion and guides carbon reduction issues [40]. Students’ career development planning comes in third but should not be overlooked, as it coincides with the views advocated by Ruichao S. [18] and Harter, C. & Asarta, C.J. [22]. University educators have a responsibility to train students to report on environmental journalism. As argued by Joachim, S., Sofia, M., etc. [41], a complete talent development process includes not only the teaching of carbon theory but also the cultivation of professional ethics of the educated and the realization of matching employment of the educated [41]. Some college students lack the awareness of the windfall of talents needed by society under carbon neutrality, so they often miss some valuable opportunities. At this point, teachers play a crucial role as “information transmitters” [42]. Teaching research is considered the least critical element. Experts believe that while research can lead to progress in teaching, the current state of China’s job market requires a large number of application-oriented talents [43]. Therefore, similar to the cross-cutting research of “media and dual-carbon policy”, the other elements are also crucial in terms of time priority (Figure 1).

**Figure 1.** The weighting of first-level indicators.

4.1.2. Judgment Matrix of Secondary Indicators

The judgment matrices of the secondary indicators were constructed, and the results are given in Table 6. The coefficients CR from their consistency tests are 0.021, 0.022, 0.000, and 0.024, respectively, all of which are less than 0.1, which indicates that the judgment matrices have reliable consistency [37].

Table 6. Judgment matrix of the second-level indicators.

Indicator	F ₁				F ₂				F ₃				F ₄					
	F _{1,1}	F _{1,2}	F _{1,3}	Weight	F _{2,1}	F _{2,2}	F _{2,3}	F _{2,4}	Weight	F _{3,1}	F _{3,2}	F _{3,3}	Weight	F _{4,1}	F _{4,2}	F _{4,3}	F _{4,4}	Weight
F ₁	F _{1,1}	1.000	1.828	2.265	0.4950													
	F _{1,2}	0.547	1.000	1.920	0.3150													
	F _{1,3}	0.441	0.521	1.000	0.1900													
	Test	$\lambda_{\max} = 3.021, CI = 0.011, CR = 0.021$																
F ₂	F _{2,1}				1.000	2.650	2.894	2.973	0.4748									
	F _{2,2}				0.377	1.000	1.550	2.196	0.2320									
	F _{2,3}				0.346	0.645	1.000	1.792	0.1738									
	F _{2,4}				0.336	0.455	0.558	1.000	0.1194									
Test					$\lambda_{\max} = 4.059, CI = 0.020, CR = 0.022$													
F ₃	F _{3,1}									1.000	1.279	1.870	0.4320					
	F _{3,2}									0.782	1.000	1.387	0.3320					
	F _{3,3}									0.535	0.721	1.000	0.2350					
	Test									$\lambda_{\max} = 3.000, CI = 0.001, CR = 0.000$								
F ₄	F _{4,1}													1.000	1.939	1.838	1.733	0.3751
	F _{4,2}													0.516	1.000	1.338	1.685	0.2461
	F _{4,3}													0.544	0.747	1.000	1.748	0.2188
	F _{4,4}													0.577	0.593	0.572	1.000	0.1601
Test													$\lambda_{\max} = 4.064, CI = 0.021, CR = 0.024$					

According to Table 7, under the four primary indicators, a varying number of secondary indicators are elected, whose extents do not cross each other and are the main influencing factors for each primary indicator [28]. The factor of informing students about the dual-carbon policy was considered the most important in the curriculum content, occupying even about 50%. According to the experts' interviews, a policy's practice starts with popularization. Only if college students understand the dual-carbon policy's meaning, intent, and benefits can deeper work be carried out, similar to the study view of Drummond C. and Siegrist M. [44]. A theoretical investigation is considered the main factor in the assessment method. Although we advocate practical application, blind practice without theoretical reserves and lack of methodological guidance will not lead to the expected gains for the educated [45]. While according to the experts, diversified, practical, and innovative assessment methods are still advocated. University students' professional ethics and professionalism have a crucial position in students' career development and planning, consistent with the findings of Yi Fang, L., Shuching, Y. etc. [10]. The journalism industry guides public opinion, and deviations in news coverage can have obvious socio-economic impacts; sometimes, it may be the price fluctuation of a particular stock, and sometimes it may be the stability of people's livelihood. The dual-carbon policy is about the future sustainable human development; therefore, it is necessary to cultivate a group of talents with good ethics and professionalism [46]. The indicator, or research on university residents and the theoretical studies of teaching analysis, is considered very important by experts (Table 7). The situation in China is that every region has a university that focuses on constructing journalism and communication. Experts believe in China, and graduates often choose three areas for employment: the first-tier big cities, their hometowns, and their university sites. As one of the critical destinations for receiving these talents from local colleges and universities, the residency may require students to understand local and regional characteristics [47]. Therefore, the environmental journalism curriculum reform should pay attention to the scientific research cooperation between universities and residences.

Table 7. Ranking and weighting of second-level indicators.

F ₁			F ₂			F ₃			F ₄		
Indicator	Rank	Weight	Indicator	Rank	Weight	Indicator	Rank	Weight	Indicator	Rank	Weight
F _{1,1}	1	0.4950	F _{2,1}	1	0.4748	F _{3,1}	1	0.4320	F _{4,1}	1	0.3751
F _{1,2}	2	0.3150	F _{2,2}	2	0.2320	F _{3,2}	2	0.3320	F _{4,2}	2	0.2461
F _{1,3}	3	0.1900	F _{2,3}	3	0.1738	F _{3,3}	3	0.2350	F _{4,3}	3	0.2188
			F _{1,4}	4	0.1194				F _{4,4}	4	0.1601

4.1.3. Judgment Matrices of Third-Level Indicators

The judgment matrices of the third-level indicators are analyzed, and the results are given in Tables 7–10. Firstly, three-level indicators under the course content are examined, as shown in Table 8. The consistency test coefficients CR for the three judgment matrices are 0.017, 0.045, and 0.040, respectively, which have stable credibility [37].

Table 8. Judgment matrix I of the third-level indicators.

Indicator	F _{1,1}				Weight	F _{1,2}				F _{1,3,1}	F _{1,3}		Weight
	F _{1,1,1}	F _{1,1,2}	F _{1,1,3}	F _{1,1,4}		F _{1,2,1}	F _{1,2,2}	F _{1,2,3}	F _{1,3,2}		F _{1,3,3}		
F _{1,1}	F _{1,1,1}	1.000	1.546	1.800	1.742								
	F _{1,1,2}	0.647	1.000	1.790	1.456								
	F _{1,1,3}	0.556	0.559	1.000	1.430								
	F _{1,1,4}	0.574	0.687	0.699	1.000								
	Test	$\lambda_{max} = 4.045, CI = 0.015, CR = 0.017$											
F _{1,2}	F _{1,2,1}					1.000	1.984	1.629	0.4690				
	F _{1,2,2}					0.504	1.000	1.566	0.2960				
	F _{1,2,3}					0.614	0.639	1.000	0.2350				
	Test					$\lambda_{max} = 3.047, CI = 0.023, CR = 0.045$							
	F _{1,3,1}									1.000	1.960	1.495	0.4590
F _{1,3}	F _{1,3,2}									0.510	1.000	1.399	0.2890
	F _{1,3,3}									0.669	0.715	1.000	0.2530
	Test									$\lambda_{max} = 3.041, CI = 0.021, CR = 0.040$			

Table 9. Ranking and weighting of third-level I indicators.

Indicator	F _{1,1}		Indicator	F _{1,2}		Indicator	F _{1,3}	
	Rank	Weight		Rank	Weight		Rank	Weight
F _{1,1,1}	1	0.3545	F _{1,2,1}	1	0.4690	F _{1,3,1}	1	0.4590
F _{1,1,2}	2	0.2735	F _{1,2,2}	2	0.2960	F _{1,3,2}	2	0.2890
F _{1,1,3}	3	0.1976	F _{1,2,3}	3	0.2350	F _{1,3,3}	3	0.2530
F _{1,1,4}	4	0.1744						

Table 10. Judgment matrix II of the third level indicators.

Indicator	F _{2,1}				F _{2,2}				F _{2,3}			F _{2,4}				
	F _{2,1,1}	F _{2,1,2}	F _{2,1,3}	Weight	F _{2,2,1}	F _{2,2,2}	F _{2,2,3}	Weight	F _{2,3,1}	F _{2,3,2}	Weight	F _{2,4,1}	F _{2,4,2}	Weight		
F _{2,1}	F _{2,1,1}	1.000	2.564	2.927												
	F _{2,1,2}	0.390	1.000	1.496												
	F _{2,1,3}	0.342	0.668	1.000												
	Test	$\lambda_{max} = 3.008, CI = 0.004, CR = 0.008$														
F _{2,2}	F _{2,2,1}					1.000	2.103	2.080	0.5050							
	F _{2,2,2}					0.476	1.000	1.763	0.2930							
	F _{2,2,3}					0.481	0.567	1.000	0.2020							
	Test					$\lambda_{max} = 3.037, CI = 0.019, CR = 0.071$										
F _{2,3}	F _{2,3,1}									1.000	1.800	0.6430				
	F _{2,3,2}									0.550	1.000	0.3570				
	Test									$\lambda_{max} = 2.00, CI = 0.00, CR = 0.000$						
F _{2,4}	F _{2,4,1}													1.000	2.440	0.7090
	F _{2,4,2}													0.410	1.000	0.2910
	Test													$\lambda_{max} = 2.00, CI = 0.00, CR = 0.00$		

In Table 9, the timeliness of the policy is considered the most crucial aspect in the process of popularizing the dual-carbon policy to students, which coincides with the

findings of Fushuai, W. [1] Ruichao, X., etc. [18] and Katarzyna, M.K. [48]. Policies change with time, and all social departments will respond to them on time [49]. At the same time, the timeliness of the news is closely related to the timeliness of the policy [48]. Therefore, experts believe that the timely communication and interpretation of the latest dual-carbon policy to students is a crucial focus of environmental journalism education. Experts consider students' basic understanding of the policy far more critical than other factors in the student feedback process. Only when students understand the basic meaning of the policy and have a comprehensive knowledge of it can they practice, innovate, and develop it. Furthermore, only when they have a basic understanding of the policy can teachers further analyze it in depth [40].

Similarly, case-based and problem-based teaching models are considered to be of significant importance in the process of students' autonomous participation. This coincides with the developmental evaluation of teaching and learning advocated in China [39]. Case-based and problem-based classes enable students to visualize and think deeply about policy theory [50].

The judgment matrices of the three-level indicators under the assessment method are analyzed, and their results are shown in Table 10. The consistency test coefficients for the four judgment matrices are 0.008, 0.071, 0.000, and 0.000, which were all less than 0.1, indicating adequate consistency [37].

According to Table 11, the attendance rate is considered the most essential part of the theoretical investigation process, and its importance reaches 57.40%. Experts generally believe that the classroom is the main place for education, where teachers bring theories, experiences, and enlightenment, and at the same time, students bring their curiosity and questions. This result is consistent with the study of Zoe, M. [35]. The interaction between the two parties takes place in the classroom and not elsewhere [35]. In addition, in colleges and universities, most undergraduate students rarely have the opportunity to interact with their teachers face-to-face and regularly outside of class. Therefore, classroom attendance is highly valued by experts. The writing and production of dual-carbon theme news are also considered very important in the practical assessment. This includes two aspects: writing news content and producing complete news reports, such as recording and editing. This covers significant steps, from editing to reporting news [51]. Therefore, it has attracted much attention. The dimensions of the selection of dual-carbon topics and the interdisciplinary collaboration on carbon topics are considered the most central aspects of the exploratory and practical assessments. Only by grasping the main dimensions of talking topics and the hot issues of people's livelihood that need to be solved urgently in the complex social system can the news value be enhanced [51]. Therefore, experts consider the dimension of carbon topic selection the key element. At the same time, reducing carbon emissions may involve other sciences such as nature, engineering, law, and economics [52,53]. Journalists need comprehensive social observation and the ability to work with other talents in related scientific fields with limited energy [54]. This ability is what experts now believe needs to be focused on in China's environmental education reform.

Table 11. Ranking and weighting of third-level II indicators.

F _{2,1}			F _{2,2}			F _{2,3}			F _{2,4}		
Indicator	Rank	Weight	Indicator	Rank	Weight	Indicator	Rank	Weight	Indicator	Rank	Weight
F _{2,1,1}	1	0.5740	F _{2,2,1}	1	0.5050	F _{2,3,1}	1	0.6430	F _{2,4,1}	1	0.7090
F _{2,1,2}	2	0.2460	F _{2,2,2}	2	0.2930	F _{2,3,2}	2	0.3570	F _{2,4,2}	2	0.2910
F _{2,1,3}	3	0.1800	F _{2,2,3}	3	0.2020						

Table 12 shows the results of the three-level index judgment matrix under the student development plan. The values of *CR* are 0.060, 0.000, and 0.077, which are reliably consistent through the consistency test [37].

Table 12. Judgment matrix III of the third-level indicators.

Indicator	F _{3,1}				Weight	F _{3,2}			F _{3,3}				Weight
	F _{3,1,1}	F _{3,1,2}	F _{3,1,3}	F _{3,1,4}		F _{3,2,1}	F _{3,2,2}	Weight	F _{3,3,1}	F _{3,3,2}	F _{3,3,3}	F _{3,3,4}	
F _{3,1}	F _{3,1,1}	1.000	1.886	1.522	2.055							0.3670	
	F _{3,1,2}	0.530	1.000	1.837	1.533							0.2643	
	F _{3,1,3}	0.657	0.544	1.000	1.781							0.2155	
	F _{3,1,4}	0.487	0.652	0.561	1.000							0.1532	
	Test	λ _{max} = 4.092, CI = 0.031, CR = 0.060											
F _{3,2}	F _{3,2,1}					1.000	1.540	0.6060					
	F _{3,2,2}					0.650	1.000	0.3940					
	Test					λ _{max} = 2.00, CI = 0.00, CR = 0.000							
F _{3,3}	F _{3,3,1}							1.000	2.337	2.301	1.781	0.3992	
	F _{3,3,2}							0.428	1.000	2.499	1.874	0.2733	
	F _{3,3,3}							0.435	0.400	1.000	1.837	0.1784	
	F _{3,3,4}							0.561	0.534	0.544	1.000	0.1491	
	Test							λ _{max} = 4.206, CI = 0.069, CR = 0.077					

In Table 13, the option, report strength, and guidance for public opinion are considered crucial aspects of ethics and professionalism. The results are consistent with the findings of Katarzyna, M.K. [48] and Kong, Y. & Kong, Y. [55]. The news industry is the hub of social information transmission, and its importance determines that practitioners must have the ability to control news reports’ scale and correctly guide public opinion standardization [55]. News can regulate all stakeholders, partly because of its deterrent power of public opinion impact [55]. Therefore, experts believe that in promoting carbon neutrality, the social and economic rights and interests of all stakeholders will inevitably be involved, and practitioners must have a strong ability to control the reporting strength and correctly guide public opinion. Diversifying practitioners’ abilities required by “journalism and dual-carbon” is the focus of the work to popularize employment information and narrow the gap in the dual-carbon-related industries [44]. Journalists engaged in dual-carbon news reporting are considered to have the ability of policy interpretation, legal basis and economic common sense, and other related majors. Therefore, experts focus more on cultivating students’ diversified skills in universities. Experts consider content creation for dual-carbon-themed journalism to be the most important factor in environmental journalism. The form of news reporting has become diverse with the innovation of media tools, but the content of the text is often at the core of a news story [56]. Solid expression skills, keen insight, and a comprehensive perspective on issues are all excellent qualities needed for content creation [56].

Table 13. Ranking and weighting of third-level III indicators.

Indicator	F _{3,1}		Indicator	F _{3,2}		Indicator	F _{3,3}	
	Rank	Weight		Rank	Weight		Rank	Weight
F _{3,1,1}	1	0.3670	F _{3,2,1}	1	0.6060	F _{3,3,1}	1	0.3992
F _{3,1,2}	2	0.2643	F _{3,2,2}	2	0.3940	F _{3,3,2}	2	0.2733
F _{3,1,3}	3	0.2155				F _{3,3,3}	3	0.1784
F _{3,1,4}	4	0.1532				F _{3,3,4}	4	0.1491

The results of the judgment matrix of the three-level indicators under teaching research are given in Table 14. The coefficients of the consistency test are 0.000, 0.055, 0.000, and 0.065, all of which have good consistency [37].

Table 14. Judgment matrix IV of the third-level indicators.

Indicator	F _{4,1}			F _{4,2}				F _{4,3}			F _{4,4}				
	F _{4,1,1}	F _{4,1,2}	Weight	F _{4,2,1}	F _{4,2,2}	F _{4,2,3}	Weight	F _{4,3,1}	F _{4,3,2}	Weight	F _{4,4,1}	F _{4,4,2}	F _{4,4,3}	Weight	
F _{4,1}	F _{4,1,1}	1.000	1.950	0.6610											
	F _{4,1,2}	0.510	1.000	0.3390											
	Test	λ _{max} = 2.00, CI = 0.00, CR = 0.000													
F _{4,2}	F _{4,2,1}				1.000	1.891	1.250	0.4320							
	F _{4,2,2}				0.529	1.000	1.350	0.2930							
	F _{4,2,3}				0.800	0.741	1.000	0.2750							
	Test	λ _{max} = 3.057, CI = 0.028, CR = 0.055													
F _{4,3}	F _{4,3,1}						1.000	1.820	0.6450						
	F _{4,3,2}						0.550	1.000	0.3550						
	Test	λ _{max} = 2.00, CI = 0.00, CR = 0.000													
F _{4,4}	F _{4,4,1}										1.000	2.008	2.068	0.4920	
	F _{4,4,2}										0.498	1.000	2.239	0.3210	
	F _{4,4,3}										0.484	0.447	1.000	0.1870	
	Test	λ _{max} = 3.068, CI = 0.034, CR = 0.065													

Integrating school journalism disciplines with the resident media industry and constructing cross-cutting topics are considered the main aspects of resident research and study and collaboration between scholars from cross-cutting disciplines. Firstly, one of the purposes of focusing on supporting at least one university specializing in journalism in each region in China is to balance the development of the media industry between areas [22]. Secondly, universities and colleges are the primary sources of resident talent, and their scholars are the main intellectual high-level talents in each local region [43]. Therefore, it is considered essential to integrate the universities’ and colleges’ journalism disciplines with the resident media industry (Table 15). In addition, subject-driven research is often an approach taken by the Chinese academy [43].

Table 15. Ranking and weighting of third-level IV indicators.

Indicator	F _{4,1}		Indicator	F _{4,2}		Indicator	F _{4,3}		Indicator	F _{4,4}	
	Rank	Weight		Rank	Weight		Rank	Weight		Rank	Weight
F _{4,1,1}	1	0.6610	F _{4,2,1}	1	0.4320	F _{4,3,1}	1	0.6450	F _{4,4,1}	1	0.4920
F _{4,1,2}	2	0.3390	F _{4,2,2}	2	0.2930	F _{4,3,2}	2	0.3550	F _{4,4,2}	2	0.3210
			F _{4,2,3}	3	0.2750				F _{4,4,3}	3	0.1870

On the one hand, a subject group can recruit researchers from different majors; on the other hand, a subject project can provide the necessary financial support for their research. All these favorable conditions will facilitate the research on carbon-themed environmental journalism. Similarly, the multidimensional interpretation of dual-carbon policy and teaching is considered the main aspect of research on the timeliness of interpreting policies and teaching methods. Firstly, a multidimensional interpretation of the policy implies an expression of comprehensiveness in comprehending the policy. The dual-carbon policy involves many industries characterized by multi-stages, regional differences, and industry differences [44], so researchers and teachers must be able to interpret multi-dimensional. Secondly, despite the emphasis on complex talents, each researcher’s interest does not provide a comprehensive explanation of the complex system of dual-carbon policy. It is often necessary for teachers from different majors and colleges to teach each other [50]. This is also considered an effective way to supplement the scarcity of compound talents.

4.1.4. An Establishment of the Combined Weights of the Integrated Indicator System

According to the judgment matrix of each level of indicator, the combined weight of each factor is finally determined, which means that a comprehensive system for evaluating the curriculum reform of environmental journalism under the dual-carbon policy in China is constructed (Table 16). All experts’ opinions are considered, and among all the indicators, the important top three are the students’ attendance rate of courses related to the dual-

carbon policy topic, the timeliness of teachers' lectures on dual-carbon policy, and students' basic knowledge of dual-carbon policy. These aspects should be highly considered. The reform of the environmental journalism curriculum under the dual-carbon target aims to cultivate professional talents for society and regulate the energy-saving and emission-reducing behaviors of all interested parties by guiding public opinion through journalism. The evaluation system for this process should be as scientific and comprehensive as possible.

Table 16. The combined weight of each indicator in the indicator system.

Tier 1 Indicator	Weight	Tier 2 Indicator	Weight	Tier 3 Indicator	Weight	Combined Weight		
F ₁	0.3184	F _{1,1}	0.4950	F _{1,1,1}	0.3545	0.0559		
				F _{1,1,2}	0.2735	0.0431		
				F _{1,1,3}	0.1976	0.0311		
				F _{1,1,4}	0.1744	0.0275		
		F _{1,2}	0.3150	F _{1,2}	0.3150	F _{1,2,1}	0.4690	0.0470
						F _{1,2,2}	0.2960	0.0297
						F _{1,2,3}	0.2350	0.0236
						F _{1,3,1}	0.4590	0.0278
						F _{1,3,2}	0.2890	0.0175
						F _{1,3,3}	0.2530	0.0153
						F _{2,1,1}	0.5740	0.1017
						F _{2,1,2}	0.2460	0.0436
F ₂	0.3732	F _{2,1}	0.4748	F _{2,1,3}	0.1800	0.0319		
				F _{2,2,1}	0.5050	0.0437		
				F _{2,2,2}	0.2930	0.0254		
				F _{2,2,3}	0.2020	0.0175		
		F _{2,3}	0.1738	F _{2,3}	0.1738	F _{2,3,1}	0.6430	0.0417
						F _{2,3,2}	0.3570	0.0232
						F _{2,4,1}	0.7090	0.0316
						F _{2,4,2}	0.2910	0.0130
		F _{2,4}	0.1194	F _{2,4}	0.1194	F _{3,1,1}	0.3670	0.0286
						F _{3,1,2}	0.2643	0.0206
						F _{3,1,3}	0.2155	0.0168
						F _{3,1,4}	0.1532	0.0120
F ₃	0.1806	F _{3,2}	0.3320	F _{3,2,1}	0.6060	0.0363		
				F _{3,2,2}	0.3940	0.0236		
				F _{3,3,1}	0.3992	0.0170		
				F _{3,3,2}	0.2733	0.0116		
		F _{3,3}	0.2360	F _{3,3}	0.2360	F _{3,3,3}	0.1784	0.0076
						F _{3,3,4}	0.1491	0.0064
						F _{4,1,1}	0.6610	0.0317
						F _{4,1,2}	0.3390	0.0163
		F ₄	0.1278	F _{4,1}	0.3751	F _{4,2,1}	0.4320	0.0136
						F _{4,2,2}	0.2930	0.0092
						F _{4,2,3}	0.2750	0.0086
						F _{4,3,1}	0.6450	0.0180
F _{4,3}	0.2188			F _{4,3}	0.2188	F _{4,3,2}	0.3550	0.0099
						F _{4,4,1}	0.4920	0.0101
						F _{4,4,2}	0.3210	0.0066
						F _{4,4,3}	0.1870	0.0038

4.2. Evaluation of the Current Situation

Using a scale of 1-10 integers, experts are invited to rate each aspect of the current Chinese environmental journalism education curriculum to achieve carbon neutrality. The higher the score, the better the environmental journalism education program performed in that aspect. The maximum, minimum, and standard deviation of scores are then analyzed to identify differences in the performance of environmental journalism curriculum reform in different regions of China in various aspects. The averages for each Level 3 indicator are

used as the final score for each item. From right to left, the scores for each of the Level 2 indicators are obtained by multiplying the weights of each item. Similarly, the scores for the Level 1 indicators and the total score are calculated. Four grades are adopted: excellent, good, qualified, and unqualified. Assuming that *S* is the composite score of an item (i.e., raw score × weight of that item), the corresponding relationships are listed in Table 17.

Table 17. Correspondence of score, grade, and symbol.

Score	Grade	Symbol
$7.5 \leq S$	Excellent	A
$5.00 \leq S < 7.5$	Good	B
$2.50 \leq S < 5.00$	Qualified	C
$S < 2.50$	Unqualified	D

Table 18 shows each score’s results and the third-level indicators’ statistical characteristics. The statistical characteristics of the third-level indicators show that the standard deviations of the two indicators, “Dual-carbon and Journalism” interactive Q&A and flipped classes, are larger. This indicates that there is wide variability in students’ autonomous participation in carbon-themed environmental journalism between different regions of China. At the same time, the standard deviation of the popularization of industry laws and regulations, self-regulation, and the application of the process of We Media is small [57]. It shows that the development gap between Chinese regions is small in these two aspects.

Table 18. Scores of the status of environmental journalism curriculum reform with a target of dual-carbon.

Overall	Grade	Tier 1 Indicator	Score	Grade	Tier 2 Indicator	Score	Grade	Tier 3 Indicator	Score	Grade	N	AVG	MAX	MIN	S.D.			
7.40	A	F ₁	7.14	B	F _{1,1}	7.50	A	F _{1,1,1}	7.68	A	50	7.68	10	2	1.6904			
								F _{1,1,2}	7.38	B	50	7.38	10	2	1.7192			
								F _{1,1,3}	7.36	B	50	7.36	10	2	1.7060			
								F _{1,1,4}	7.46	B	50	7.46	10	2	1.6877			
					F _{1,2}	6.80	B	F _{1,2,1}	7.08	B	50	7.08	10	2	1.7069			
								F _{1,2,2}	6.58	B	50	6.58	9	2	1.6136			
								F _{1,2,3}	6.50	B	50	6.5	9	2	1.5395			
								F _{1,3}	6.78	B	50	6.76	10	2	1.7036			
					F ₂	7.49	B	F _{2,1}	7.59	A	F _{2,1,1}	6.82	B	50	6.82	10	1	1.8077
											F _{2,1,2}	7.62	A	50	7.62	10	3	1.5606
											F _{2,1,3}	7.64	A	50	7.64	10	2	1.4664
											F _{2,2}	7.43	B	50	7.42	10	2	1.6011
		F _{2,2}	7.43	B				F _{2,2,1}	7.54	A	50	7.54	10	3	1.4312			
								F _{2,2,2}	7.42	B	50	7.42	10	3	1.4979			
								F _{2,2,3}	7.16	B	50	7.16	10	2	1.6415			
								F _{2,3}	7.35	B	50	7.44	10	2	1.4444			
		F ₃	7.56	A				F _{2,3}	7.35	B	F _{2,3,1}	7.20	B	50	7.2	10	2	1.4000
											F _{2,4}	7.40	B	50	7.4	10	1	1.5875
											F _{2,4,1}	7.40	B	50	7.4	10	2	1.4832
											F _{2,4,2}	7.74	A	50	7.74	10	2	1.3973
					F _{3,1}	7.62	A	F _{3,1,1}	7.64	A	50	7.64	10	2	1.4389			
								F _{3,1,2}	7.68	A	50	7.68	10	3	1.2238			
								F _{3,1,3}	7.22	B	50	7.22	10	4	1.4462			
								F _{3,2}	7.57	A	50	7.52	10	3	1.3303			
					F ₄	7.54	A	F _{3,2}	7.57	A	F _{3,2,1}	7.64	A	50	7.64	10	2	1.3529
											F _{3,3}	7.43	B	50	7.38	10	1	1.4818
											F _{3,3,1}	7.42	B	50	7.42	10	4	1.3869
											F _{3,3,2}	7.60	A	50	7.6	10	2	1.2961
		F _{4,1}	7.53	A				F _{3,3,3}	7.40	B	50	7.4	9	3	1.2166			
								F _{3,3,4}	7.60	A	50	7.6	10	3	1.3711			
								F _{4,1,1}	7.38	B	50	7.38	10	4	1.2632			
								F _{4,2}	7.58	A	50	7.44	10	3	1.4023			
		F _{4,2}	7.58	A				F _{4,2,1}	7.44	B	50	7.44	10	3	1.4023			
								F _{4,2,2}	7.62	A	50	7.62	10	2	1.4952			
								F _{4,2,3}	7.74	A	50	7.74	10	3	1.3537			
								F _{4,3}	7.62	A	50	7.56	10	2	1.3879			
					F _{4,3,1}	7.74	A	50	7.74	10	2	1.3684						
					F _{4,3,2}	7.74	A	50	7.74	10	2	1.3684						
					F _{4,4}	7.41	B	50	7.34	10	1	1.5442						
					F _{4,4,1}	7.56	A	50	7.56	10	2	1.4165						
		F _{4,4,2}	7.32	B	50	7.32	10	3	1.4621									
		F _{4,4,3}	7.32	B	50	7.32	10	3	1.4621									

To achieve carbon neutrality, the current situation score of China’s environmental news curriculum reform is 7.40, which is a good performance; however, there is still room for improvement. The top performers in the status scores are career development planning and teaching research. Experts attribute the reasons why career development planning

is considered excellent to the strength of China's implementation of the "carbon peaking and carbon neutral" policy and the benefits of practice-oriented teaching in journalism in China. There are many reasons for the improvement in teaching research, and experts generally agree that it is the result of China's heavy investment in bidding for academic programs and the improvement in professors based on student information feedback. The scores for the Tier 1 indicators show that the course content and assessment method should continue to be improved. They score 7.14 and 7.49, respectively, with both performance ratings falling into the good category.

Regarding the course content, feedback on students' understanding of policies and independent participation is rated as good. If we want to improve the quality of course content further, we should start with these two aspects. Practical, inquiry-based, and collaborative assessment methods are still considered to have room for improvement. Diverse, effective, and reasonable assessment methods are advocated [58]. In addition to theoretical evaluation, decision-makers and educators should pay attention to the other three aspects of assessment. Only by consolidating the results and improving the deficiencies can China's environmental education continue cultivating high-quality journalistic talents for future carbon neutrality.

5. Conclusions and Policy Implications

Environmental journalism regulates stakeholders to save energy and reduce emissions and promote the process of carbon neutrality relying on the pressure of public opinion. To explore a model for cultivating counterpart journalism talent, a well-structured questionnaire was used to collect data from 50 journalism experts in China to evaluate environmental journalism curriculum reform with the aim of the dual-carbon goal. The experts were asked to rate the current performance of environmental journalism education in China.

According to the experts' comparisons of the importance of the factors, difficult-to-quantify issues in complex systems are addressed by introducing AHP. Judgment matrices of primary, secondary, and tertiary indicators are constructed, and consistency tests verify their reliability. Finally, a comprehensive system for evaluating the environmental journalism curriculum reform for achieving carbon neutrality is obtained.

The assessment method is the most important factor among the primary indicators because experts believe that the previously written examination lacked practicality and innovation. Future studies should focus on the transfer and application of the expertise learned by the talents. Among the secondary indicators, the popularity of the dual-carbon policy, theoretical assessment, ethics and professionalism, and resident regional carbon reduction studies are considered the most crucial elements. First, the implementation of a policy starts from its popularization, and only when talents understand the meaning, intention, and benefits of the dual carbon policy can they carry it out in-depth. Therefore, the popularization of the dual-carbon policy is considered important. Second, deviations in journalism can have a significant negative impact on the social economy. Therefore, practitioners are required to have good ethics and professionalism. Thirdly, the study of carbon reduction in the resident region is considered critical because the resident is one of the main employment areas for university graduates in the local region. In addition, among the tertiary indicators, the timeliness of interpreting policy, students' basic knowledge of dual-carbon policy, case-based and problem-based teaching, attendance of carbon-themed environmental journalism courses, carbon-themed journalism writing and production, assessment of topic selection dimension, interdisciplinary practice cooperation, reporting strength, and public opinion guiding ability are considered more essential among many elements under each secondary indicator.

Based on the experts' scores for each tertiary indicator, we multiplied the weight of each item to work backwards to arrive at the scores for each tertiary indicator. We rated them to explore the results of the current environmental journalism curriculum reform in China and the aspects that need to be improved. Overall, the scores performed

well, but there is still room for improvement. Students' career development planning and teaching research are excellent, but course content and assessment methods should continue to be improved, and they are both rated as good. Among the two factors that need to be improved, students' feedback on policy understanding, students' independent participation, practical assessment, inquiry assessment, and cooperative assessment are insufficient, and other aspects are excellent. This suggests that the students' understanding of dual-carbon policies and their participation in practical sessions need to be enhanced to improve the quality of course content. Moreover, diverse, effective, and reasonable assessment methods should be promoted to enhance the professional skills assessment component of China's environmental journalism talent-cultivating process. Based on the study findings, the following policy implications can be suggested.

To cultivate professional talents, it is suitable for dual-carbon theme reporting; the environmental journalism curriculum should be actively reformed and improved. To evaluate the reform results, scientific methods should be adopted to offset the adverse effects of the decision-makers' subjectivity as much as possible. Through scoring and rating, identified problems should be proactively improved in the forthcoming years.

Generally, Chinese environmental journalism curriculum reform has performed well, but there are still some shortcomings. Course content and assessment methods should continue to be refined. To improve the quality of the course content, it is necessary to focus on two aspects: students' feedback on policy understanding and students' independent participation. Practical inquiry and collaborative assessments still need to be improved. Decision-makers and educators should take diverse, effective, and reasonable assessment methods seriously.

6. Limitations and Future Research

There are three main limitations of this study. First, this study included one of the multi-criteria decision models (the AHP method); however, it is required to use other multi-criteria decision models to verify the robustness of the results. Second, the cultivation of carbon-neutral-themed environmental journalism talents is a broad topic; however, the current study only focused on the most important general aspects of indicators based on the experts' opinions. Third, although our research covered 80% of China in terms of geographical area, it is required to further refine the results if more experts could be interviewed. Therefore, future studies must focus on multi-criteria decision models for testing and analyzing the results.

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