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Investigation and Analysis on the Integration of Chinese Excellent Traditional Culture Into High School Biology Teaching in Ethnic Minority Areas

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Abstract: In order to explore the teaching status of excellent traditional Chinese culture in high school biology teaching in ethnic areas, this paper selects 375 high school students from a certain ethnic middle school in Yunnan Province, China to carry out a survey, so as to provide reference for integrating traditional Chinese culture into middle school biology classroom.

Keywords: Excellent Traditional Chinese Culture; High School Biology Teaching; Investigation And Analysis

The inheritance and promotion of China's excellent traditional culture, as a core component of building a strong socialist cultural nation and enhancing the cultural literacy of the people, holds an irreplaceable position. The' Ordinary High School Biology Curriculum Standards '(2017 Edition, 2020 Revision) emphasizes the importance of inheriting and promoting China's excellent traditional culture, revolutionary culture, and advanced socialist culture. It aims to cultivate students 'political qualities, moral character, and a well-rounded personality, thereby strengthening their confidence in the path, theory, system, and culture of socialism with Chinese characteristics [1]. Integrating China's excellent traditional culture into the daily biology teaching of middle school students is essential for classroom instruction, subtly influencing students culturally, helping them build cultural confidence and national identity, and enhancing ethnic cohesion and patriotic sentiments [2]. This article explores the teaching status of China's excellent traditional culture in high school biology education in ethnic regions through a questionnaire survey, providing data support for finding methods to integrate China's excellent traditional culture into middle school biology teaching.

1. Survey Methods

In this survey, six classes of grade two students from a national middle school in Yuxi City, Yunnan Province, China were selected as the subjects. Questionnaire survey method was adopted to collect students' attitudes, implementation difficulties and suggestions on integrating Chinese traditional culture into daily teaching. A total of 375 questionnaires were distributed, and 360 effective questionnaires were collected after screening, with an effective recovery rate of 96%.

Based on the content of the People's Education Press high school biology textbook and the core competencies of the biology discipline, a questionnaire was developed to assess students' understanding and attitudes towards traditional Chinese culture and biology. The questionnaire consists of 20 questions, including 18 multiple-choice questions and 2 multiple-answer questions. The survey focuses on four key areas: students' interest in traditional Chinese culture and biology, their basic knowledge of excellent traditional Chinese culture, their attitude towards teachers integrating excellent traditional culture into teaching, and their grasp of incorporating some traditional cultural elements into biology knowledge. The question numbers corresponding to each dimension of the questionnaire are listed in Table 1.

2. Reliability and validity analysis of the questionnaire

The reliability of the questionnaire was analyzed using SPSS, with a Cronbach's α

coefficient of 0.914 for the overall scale, significantly higher than the excellent reliability standard of 0.9. This high reliability coefficient indicates strong inter-item correlation, making the scale suitable for subsequent empirical research and data analysis. The reliability analysis is detailed in Table 2. The study conducted KMO and Bartlett's sphericity tests on the sample data, yielding a KMO value of 0.960, which is above the threshold of 0.9, indicating significant partial correlations among the variables. The p-value from the Bartlett's sphericity test is also less than 0.001, further confirming the significant correlation between the variables and the validity of the factor analysis. The validity analysis is presented in Table 3.

Table 1. Questionnaire Dimensions Corresponding to Question Numbers

Investigation dimensions	Question numbers
Corresponding question numbers for students' interest in traditional Chinese culture and biology subjects	1、2
Basic understanding of excellent traditional Chinese culture among students	3、4
Students' attitudes towards teachers integrating excellent traditional culture into the teaching process	5-12
Students' mastery of integrating some traditional culture into biological knowledge	13-20

Table 2. Reliability Analysis of Student Questionnaire Survey

Number of items	sample size	Cronbach's alpha coefficient
18	360	0.914

Table 3. Validity Analysis of Student Questionnaire Survey

KMO test and Bartlett's test		
KMO value		0.96
Bartlett sphericity test	Approximate chi square	2317.924
	df	153
	P value	0.000

3. Result analysis

3.1 Analysis of Students' Interest in Traditional Chinese Culture

This dimension investigates students 'interest in Chinese traditional culture and biology, as detailed in Table 1. The survey results show that the frequency analysis examines students' interest levels in biology and Chinese traditional culture. Regarding the question 'Your level of interest in biology,' 78.89% of students chose 'very much like' or 'like,' with 'like' being the most common choice at 44.17%, while only 10.27% of students indicated 'dislike' or 'very dislike.' This indicates that most students have a positive attitude towards biology. In terms of 'Your level of interest in Chinese traditional culture,' 79.17% of students chose 'very much like' or 'like,' with 'like' accounting for 46.67%; the proportion of those who said 'dislike' or 'very dislike' was 9.73%. This suggests that students' interest in Chinese traditional culture is comparable to their interest in biology, showing a high level of recognition and affection for both.

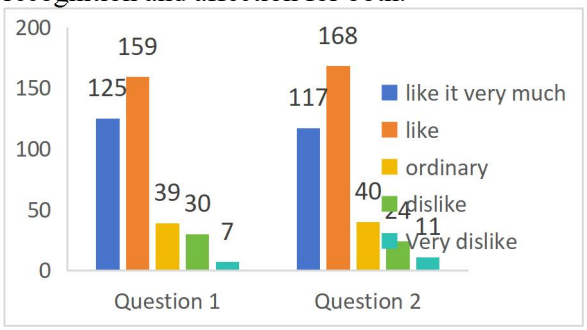

Figure 1. Students' Interest in Traditional Chinese Culture and Biology

3.2 Analysis of Students' Understanding of Excellent Traditional Chinese Culture

The survey focused on understanding students 'knowledge of Chinese traditional culture, as shown in Figure 2.

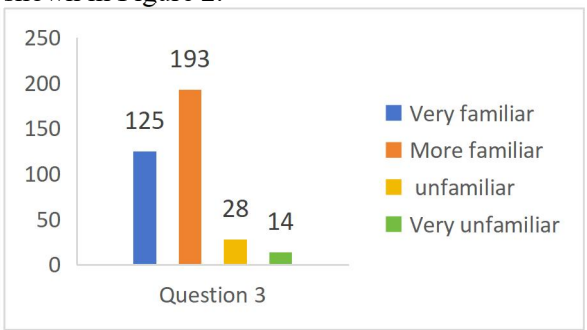

Figure 2.Students' Basic Understanding of Excellent Traditional Chinese Culture

Among the 360 valid responses, 88.33% of students indicated they were' fairly familiar 'or' very familiar 'with Chinese traditional culture, indicating a high level of awareness among most students. In contrast, only 7.78% of students reported being' not very familiar, 'and 3.89% were' very unfamiliar, 'which is

relatively low. This suggests that students generally have a positive understanding of Chinese traditional culture, with a solid foundation of knowledge and cultural identity. This finding provides valuable insights for exploring the relationship between students' cultural interests, cultural identity, and cognitive behaviors, and offers data support for designing relevant cultural education activities.

3.3 Analysis of Students' Attitudes Towards Teachers Integrating Excellent Traditional Culture into the Teaching Process

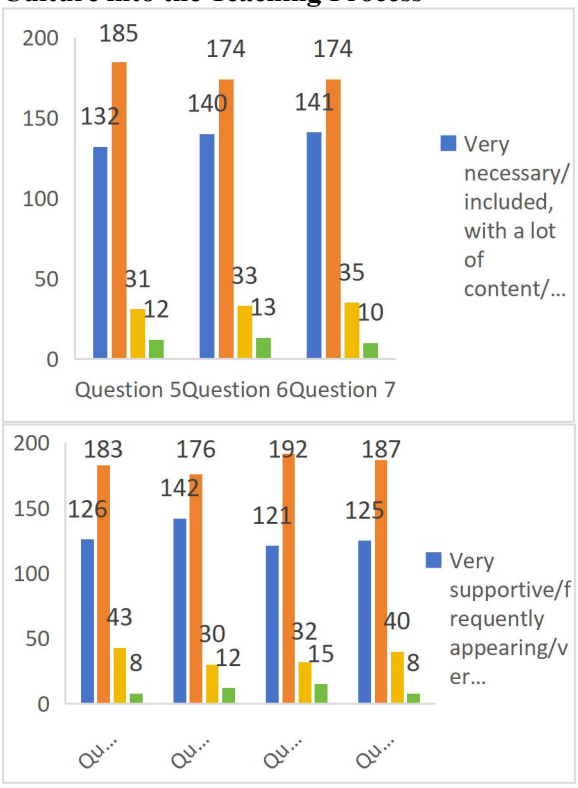

Figure 3. Students' Attitude towards Teachers Integrating Excellent Traditional Culture into the Teaching Process

This dimension focuses on students 'views on teachers integrating excellent traditional Chinese culture into teaching(Fig.3). The results show that 88.06% of students believe it is' necessary 'or' very necessary 'to educate middle school students about excellent traditional Chinese culture, reflecting a high level of recognition among students. Additionally, most students believe that the current biology curriculum for middle school students already includes relevant cultural content, with 87.22% indicating that the curriculum' contains, and has relatively more content 'or' contains, and has a lot of content, 'suggesting that elements of traditional culture are already reflected in the biology curriculum. Regarding students' willingness to learn, 87.5% of students are 'willing' or 'very willing' to learn about excellent traditional Chinese culture while studying biology, and 85.83% support or strongly support integrating the biology subject with traditional culture, indicating a high acceptance and potential for interdisciplinary integration. In terms of the frequency of cultural content in actual teaching, 48.89% of students believe it 'occasionally appears,' and 39.44% believe it 'often appears,' suggesting that traditional culture has been initially integrated into biology classes. In terms of teaching design, the vast majority of students express a desire for teachers to integrate existing Chinese cultural content from the textbook (86.94%) or supplement appropriate cultural knowledge beyond the textbook (86.67%). This indicates that students generally have a positive attitude towards integrating excellent traditional Chinese culture with the biology subject and support further promoting the coordinated development of cultural education and subject knowledge in teaching practices. The results provide theoretical support and practical reference for subsequent curriculum development and teaching reform.

3.4 Data analysis of students' mastery of some traditional culture integrated with biological knowledge

This survey aims to understand students 'comprehension and mastery of traditional cultural elements integrated into biology knowledge, as shown in Figure 4. Overall, students generally show a high level of agreement with this type of integrated teaching content. Regarding teachers' instruction, questions 13 to 15 explore the application of traditional cultural materials in the classroom. For instance, 74.72% of students found the integration of Su Shi's literature with plant hormones' very suitable 'or' somewhat suitable, 'indicating their approval of this interdisciplinary teaching approach. The explanation of' zero-waste agriculture '(question 14) and the incorporation of ancient brewing techniques and cultural stories (question 15) were rated as' very suitable 'or' somewhat suitable 'by 78.33% and 78.89% of students, respectively, showing their willingness to integrate traditional knowledge into modern biology education. In terms of

understanding traditional cultural knowledge, questions 16 to 20 focus on students' comprehension of the biological significance behind specific cultural expressions. For example, 80.28% of students chose 'very suitable' or 'somewhat suitable' for the biological information transmission method embodied in the custom of wearing sachets during the Dragon Boat Festival (question 16), and 77.5% agreed with the biological reproduction behavior described in the poem (question 17). Similarly, the choices for 'very suitable' and 'somewhat suitable' for microbial decomposition (question 18), interspecific competition (question 19), and the concepts of heredity and variation (question 20) were 77.5%,77.22%, and 78.33%, respectively, further demonstrating students' ability to understand cross-cultural biology.

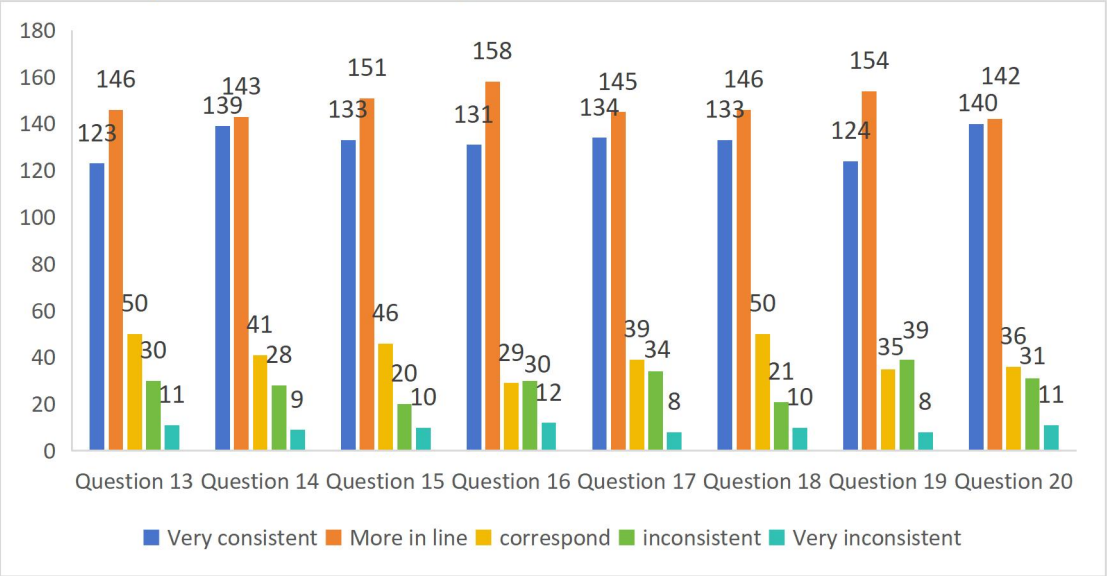

Figure 4. Students' Mastery of Integrating Some Traditional Culture into Biological Knowledge

4. Conclusion

Middle school students in ethnic minority areas generally hold a positive attitude towards the application of traditional cultural content in biology teaching, and can better understand the biological knowledge in the relevant cultural background. The integration of traditional culture and subject knowledge can not only enhance the interest of the classroom, but also enhance the comprehensive quality and cultural identity of middle school students.

Acknowledgments

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