

# Discussion on the Construction of Ideological and Political Education in High School Biology Courses under the Internet+ Background

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**Abstract:** *In the context of the Internet+ era, education models and teaching methods have undergone profound changes, presenting new opportunities and challenges for the ideological and political education in high school biology courses. This paper aims to explore how to integrate ideological and political education into high school biology courses under the Internet+ background by integrating course content, innovating teaching methods, enhancing teacher capabilities, and improving evaluation mechanisms. Through literature review, case analysis, and empirical research, this paper analyzes the necessity and feasibility of integrating ideological and political education in high school biology courses under the Internet+ background, proposes specific implementation strategies, and summarizes successful cases and lessons learned. The research finds that Internet technology provides rich resources and new pathways for ideological and political education, but there are still challenges in terms of technology, teachers, students, and school management. This paper provides theoretical basis and practical guidance for the ideological and political education in high school biology courses, aiming to promote educational modernization and cultivate students with comprehensive qualities.*

**Keywords:** *Internet+, high school biology courses, ideological and political education, educational innovation, teaching methods*

## 1. Introduction

In the context of the Internet+ era, education models and teaching methods have undergone profound changes, and the widespread application of information technology has significantly altered traditional education methods. These changes have not only improved the efficiency of accessing and disseminating educational resources but also provided more possibilities for the innovation of educational content and methods. High school biology courses, as an important part of science education, are rich in content and closely related to students' daily lives and scientific literacy. However, in traditional teaching, biology courses often focus on knowledge transmission, neglecting the integration of ideological and political education. Ideological and political education, as an important component of holistic education, plays a crucial role in shaping students' values and enhancing their comprehensive qualities. Therefore, it is particularly necessary to explore how to integrate ideological and political education into high school biology courses under the Internet+ background[1]. The main objective of this study is to explore effective ways to integrate ideological and political education into high school biology courses in the Internet+ era. Specifically, by analyzing the impact of Internet technology on high school biology courses, identifying the ideological and political education elements within the biology curriculum, proposing strategies for integrating Internet technology into ideological and political education, and validating these strategies through case analysis and empirical research, this study aims to provide practical guidance for the ideological and political education in high school biology courses and promote students' holistic development. This study holds significant theoretical and practical importance. From a theoretical perspective, research on education in the Internet+ era is still in the exploratory stage, especially the integration of subject teaching and ideological and political education. Through this study, the theoretical system of ideological and political education can be enriched, promoting the process of educational modernization. From a practical perspective, the current high school biology curriculum has certain deficiencies in ideological and political education. The specific strategies and implementation paths proposed in this paper can provide valuable references for frontline teachers, helping them better carry out ideological and political education and improve the quality of teaching. In conclusion, this study aims to provide strong support for the ideological and

political education in high school biology courses through the combination of theory and practice, promoting further development in education[2].

## **2. Research Background and Current Situation**

### ***2.1. The Role and Application of Internet+ in Education***

The advent of the Internet+ era has brought profound changes and innovation to education. The widespread use of Internet technology has broadened access to educational resources and transformed traditional teaching models. New educational models like online education platforms, virtual classrooms, and MOOCs (Massive Open Online Courses) have made resources more accessible and shareable, breaking time and space limitations and enhancing educational universality and equity. In high school education, the application of Internet+ has deepened. Teachers can utilize abundant online resources for lesson preparation and teaching, such as video lectures, e-textbooks, and virtual experiments. These resources improve teaching effectiveness and enhance students' learning interest and self-directed learning abilities. Furthermore, Internet technology enables personalized education. Through big data analysis, teachers can tailor teaching plans based on students' learning conditions and interests, improving teaching relevance and effectiveness. Currently, the application of Internet+ in education has achieved remarkable results. Many schools and educational institutions actively introduce Internet technology, building smart classrooms and campuses to promote educational informatization[3]. For example, online education platforms allow high-quality resources to reach more regions, narrowing the urban-rural education gap. Virtual laboratories make teaching subjects like biology and chemistry more vivid, allowing students to conduct independent inquiries through simulated experiments, thereby cultivating scientific literacy and experimental skills. However, challenges remain in developing Internet+ education. Firstly, the inadequacy of technical equipment and network infrastructure, especially in remote areas, affects its popularization and promotion. Secondly, teachers' application abilities vary, with some struggling to utilize Internet technology effectively. Lastly, integrating online and offline resources into a cohesive hybrid teaching model requires further exploration and resolution. Overall, Internet+ provides new momentum for educational reform and development. Exploring the construction of ideological and political education in high school biology courses under the Internet+ background is necessary for adapting to the times and crucial for improving educational quality and students' comprehensive qualities. Through Internet technology, ideological and political education can be better integrated into biology courses, fostering students' scientific literacy and social responsibility, and achieving holistic education goals[4].

### ***2.2. Current Situation and Challenges of High School Biology Courses***

High school biology courses are vital for cultivating scientific literacy, stimulating interest in science, and enhancing practical abilities. However, several challenges affect their effectiveness and educational goals. Firstly, the content is extensive and complex, covering fields such as cell biology, genetics, ecology, and evolution. This overwhelms students, making it difficult to fully understand and master topics, especially when content seems distant from daily life. Secondly, traditional teaching methods are monotonous and lack interaction, relying heavily on lectures and blackboard writing. This passive learning approach leads to a dull classroom atmosphere, reducing students' interest and enthusiasm. Furthermore, biology involves many experiments, but due to equipment and time constraints, students have limited hands-on opportunities, hindering their practical skills development. Thirdly, the evaluation mechanism is primarily focused on exam scores, emphasizing knowledge mastery while neglecting scientific inquiry, innovative thinking, and comprehensive qualities. This narrow focus leads to a one-sided pursuit of scores, neglecting in-depth understanding and application of knowledge. Additionally, there is an imbalance in the professional development of biology teachers, with varying levels of teaching proficiency. Some teachers have strong professional knowledge but need to improve teaching methods and educational concepts. Others struggle with new curriculum standards and teaching methods. Heavy workloads and limited training opportunities further restrict their professional growth. Moreover, the availability and utilization of course and online resources are inadequate. Despite the abundance of resources in the Internet+ era, many schools lack sufficient teaching resources due to equipment and funding limitations. Teachers' utilization of online resources is low, lacking effective integration of Internet technology with biology teaching, impacting teaching effectiveness. Lastly, the integration of ideological and political education in biology courses is insufficient. Although biology contains rich ideological elements, practical teaching often focuses more

on knowledge transmission, neglecting the cultivation of students' values and social responsibility. Strengthening this integration requires systematic design and deep fusion with biology teaching. In summary, high school biology courses face numerous challenges requiring reform and innovation. Introducing advanced resources and technologies, optimizing teaching methods and evaluation mechanisms, and strengthening ideological education can significantly improve teaching quality and effectiveness, fostering comprehensive student development[5].

### **3. The Necessity of Ideological and Political Education in High School Biology Courses under the Internet+ Background**

#### ***3.1. Educational Needs in the New Era***

In the new era, societal demands for education have significantly changed, especially with the rapid development and widespread application of Internet technology. This expansion necessitates higher requirements for education, emphasizing both the cultivation of knowledge and skills and moral education and comprehensive quality development. In this context, ideological and political education in high school biology courses is particularly necessary. Firstly, the new era demands more comprehensive and diverse talents[6]. Modern society's rapid development and continuous technological advancements require individuals with professional knowledge and skills, good moral character, and social responsibility. High school biology courses should integrate ideological and political education to foster students' scientific spirit, environmental awareness, and social responsibility alongside biological knowledge. Secondly, in the Internet+ context, the ways of accessing and disseminating educational resources have fundamentally changed. Internet technology has made sharing and disseminating educational resources more convenient and widespread, enriching educational content and innovating teaching methods. By leveraging Internet technology, ideological and political education can be seamlessly integrated into high school biology courses, using rich online resources and multimedia tools to enhance teaching's attractiveness and impact, thereby increasing students' interest and participation. Thirdly, the Internet+ era enhances education's interactivity and personalization. Internet technology enables real-time interaction and communication between teachers and students, increasing classroom participation. Additionally, Internet technology can offer personalized educational plans and resources based on students' learning conditions and characteristics, improving educational outcomes. These technological tools can conduct more precise and effective education, helping students better understand and internalize ideological and political content. Lastly, education in the new era needs to foster students' innovation and practical abilities. Biology inherently has strong practical aspects. Integrating ideological and political education into biology can stimulate innovative thinking and practical skills, enabling students to solve real-world problems. For example, combining ecological protection and biotechnology with societal issues can guide students to focus on real-world problems, participate in social practices, and enhance their social responsibility and innovation awareness. In summary, the Internet+ era provides new opportunities and challenges for ideological and political education in high school biology courses. Utilizing Internet technology can better achieve the integration of ideological and political education with subject teaching, cultivating comprehensive talents for the new era. Therefore, exploring and implementing ideological and political education in high school biology courses under the Internet+ background is essential for educational development and modernization.

#### ***3.2. Ideological and Political Elements in Biology and Their Educational Significance***

High school biology courses impart biological knowledge and contain rich ideological and political education elements. Through careful design, these elements can cultivate students' moral character and comprehensive qualities, holding significant educational value. Firstly, biology content fosters students' scientific spirit and pragmatic attitude. Learning about cell biology, genetics, and evolution requires mastering scientific methods and rigorous experimentation, developing a truth-seeking scientific spirit, rational thinking, and critical thinking skills. For example, studying Darwin's theory of evolution helps students understand the exploratory nature of scientific research, recognizing that scientific truths evolve through continuous questioning. Secondly, biology covers ecological and environmental protection, cultivating students' environmental awareness and social responsibility. Topics like ecology, environmental protection, and biodiversity guide students to focus on issues such as climate change, biodiversity loss, and pollution[7]. Through case studies and projects, students' environmental awareness and action capabilities are enhanced. For instance, studying endangered species protection

helps students appreciate harmonious coexistence with nature and encourages environmental action. Thirdly, biology content fosters bioethics awareness and humanistic spirit. Topics in biotechnology and bioengineering often involve ethical issues like cloning, gene editing, and in vitro fertilization. Teachers can discuss these technologies' applications and risks, guiding students to think about the relationship between science and ethics, fostering respect for life and societal responsibility. For example, discussing gene editing leads students to consider its medical applications and ethical issues, cultivating ethical thinking and social responsibility. Additionally, biology courses on human physiology and health education help students establish healthy lifestyles and positive attitudes. Learning about body systems, nutrition, and health, teachers use real-life cases to promote health awareness and good habits. For example, teaching balanced nutrition and healthy eating highlights a healthy lifestyle's importance for personal growth and societal development. In summary, high school biology courses contain rich ideological and political education elements that enhance students' scientific literacy, environmental awareness, bioethics, and health concepts. Integrating ideological and political education into biology teaching achieves dual goals of knowledge transmission and value guidance, helping students form correct worldviews, outlooks on life, and values, thus improving their comprehensive qualities and social responsibility. This is crucial for cultivating well-rounded talents in the new era.

#### **4. Specific Strategies for Ideological and Political Education in High School Biology Courses**

##### ***4.1. Integration of Course Content***

To effectively integrate ideological and political education into high school biology courses, the integration of course content is essential. Through scientific course design, ideological and political education can be subtly incorporated while teaching biological knowledge. Teachers must carefully study textbooks during lesson preparation to identify ideological and political elements within each chapter. For instance, when explaining cell division, teachers can introduce the historical background and scientific spirit of scientists who studied cell division. When discussing ecosystems, the importance of environmental protection and sustainable development can be explored. These examples help students absorb ideological and political education while learning specialized knowledge. Thematic teaching units can be designed to organically combine ideological and political education with biological knowledge. For example, a unit on "Environmental Protection and Biodiversity" can discuss the importance of environmental protection and individual responsibility through content on ecosystems and species conservation. Similarly, a unit on "Bioethics and Biotechnology" can guide students to consider ethical issues related to genetic engineering and cloning, fostering their ethical awareness and social responsibility. These units enable students to systematically learn biological knowledge while deeply considering societal issues. Integrating current social issues and news events into the curriculum can enhance relevance and engagement. For example, during the COVID-19 pandemic, lessons on viruses and the immune system can include discussions on virus transmission mechanisms and vaccine development, highlighting the scientific spirit and civic responsibility involved in pandemic prevention. Integrating timely issues into the curriculum enhances students' sense of reality and responsibility, making ideological and political education more vivid and effective. Cross-disciplinary integration also enriches ideological and political education. For instance, combining biology with geography to discuss the impact of climate change on biodiversity or with history to tell the story of genetic research and the struggles of scientists broadens students' knowledge. This approach provides a more comprehensive ideological and political education, helping students appreciate the value and significance of knowledge from a broader social and historical perspective. Project-based learning and social practice activities are also crucial for integrating ideological and political education. Encouraging students to participate in project-based learning and social practice enhances the practical aspect of ideological and political education. For example, organizing students to conduct biological surveys and environmental protection actions helps them understand the real-world application of biological knowledge and cultivates environmental awareness and social responsibility. Finally, making full use of information technology and multimedia resources can enrich the presentation of course content. Utilizing videos, animations, and online experiments enhances the interactivity and appeal of teaching. For example, when explaining genetic engineering, teachers can show relevant documentaries and research videos to improve students' understanding. Using online platforms for discussions and interactions also promotes self-directed learning and critical thinking. The application of information technology improves teaching effectiveness and stimulates students' interest and initiative [8]. Through these strategies, ideological and political education can be effectively integrated into high school biology courses, achieving a seamless combination of

knowledge transmission and value guidance. This approach cultivates students' scientific literacy and moral qualities, contributing to the goal of holistic education. By scientifically integrating course content, teachers can impart biological knowledge and conduct ideological and political education, enabling students to develop both scientific literacy and social responsibility, becoming well-rounded individuals suited for the new era.

#### **4.2. Innovation in Teaching Methods**

Innovative teaching methods are crucial for integrating ideological and political education into high school biology courses. By adopting innovative teaching methods, students' interest and participation can be enhanced, achieving a combination of knowledge transmission and ideological and political education. Firstly, blended teaching combines online and offline instruction, utilizing internet technology to enrich teaching formats. Teachers can post preparatory materials and videos online, guiding students' self-learning, and then conduct discussions and interactions in the classroom to consolidate understanding. For example, when teaching about ecosystems, teachers can share environmental videos and cases online, prompting students to think about environmental impacts, and then organize group discussions in class. Secondly, the flipped classroom model enhances classroom efficiency and students' self-directed learning by having students learn basic concepts through videos before class and then engage in interactive activities and problem-solving during class. For example, in a lesson on genetic engineering, students can watch videos to understand basic concepts before class, and then participate in group discussions and case analyses to explore the applications and ethical issues of genetic engineering. Project-based learning (PBL) centers on students, using actual projects to stimulate interest and innovation. For example, students could design an environmental project, investigating campus biodiversity and proposing conservation measures, thereby developing teamwork and social responsibility. The situational teaching method involves designing real or simulated scenarios to guide students in role-playing and experiencing the situation, enhancing emotional resonance and moral judgment. For example, in a lesson on the human body system, a simulated hospital scenario can be created where students act as doctors, nurses, and patients to understand medical ethics and cultivate empathy and responsibility. Using information technology and multimedia resources is also an essential method. Videos, animations, and virtual experiments make teaching more intuitive and engaging. For example, animations showing cell division processes can help students grasp complex concepts, and online platforms can facilitate discussions and interactions, promoting self-learning and collaboration. Innovations in experimental teaching can also enhance the effect of ideological and political education. For example, designing a water pollution experiment where students collect and analyze water samples and discuss improvement measures can strengthen environmental awareness and responsibility. These innovative methods can significantly improve the quality of high school biology teaching and the effectiveness of ideological and political education, stimulating students' interest and cultivating their comprehensive qualities and social responsibility, thereby achieving holistic education goals.

#### **5. Challenges and Solutions in Implementation**

Despite the positive changes brought by innovative strategies in the ideological and political education of high school biology courses under the Internet+ background, several challenges need to be addressed systematically to ensure successful implementation. **Technical Challenges:** Many schools, especially in remote areas, lack the necessary technological equipment and internet infrastructure, limiting the application of internet technology in teaching. Teachers may face technical issues without timely support and training. Solutions include increasing investment in educational informatization, improving schools' technical equipment and internet infrastructure, and establishing professional technical support teams. Regular teacher training can help them master the use of internet technology and enhance their teaching capabilities. **Teacher Challenges:** Varying abilities to apply information technology and heavy workloads are significant issues. Some teachers lack sufficient understanding of internet technology and ideological education, affecting curriculum implementation. Additionally, the substantial workload of teachers can increase with additional tasks. Solutions include organizing regular training for teachers in information technology and ideological education, sharing excellent teaching experiences through demonstration lessons, and alleviating workloads through reasonable task distribution. Forming ideological education teams can focus efforts on curriculum implementation, reducing frontline teachers' burden. **Student Challenges:** Lack of participation, self-discipline, and varying learning abilities are common. Some students show little interest in internet teaching and

ideological education, leading to low participation and effectiveness. Solutions include employing diverse and interactive teaching content and activities to stimulate learning interest. Methods like gamification and project-based learning can increase engagement. Providing personalized learning support and resources based on students' abilities and interests, and offering additional assistance to weaker students, can help them keep up with the progress. By addressing these challenges with systematic solutions, ideological and political education in high school biology courses can be effectively implemented, improving teaching quality and educational outcomes, and fostering comprehensive development in students.

## 6. Conclusion

Under the Internet+ background, integrating ideological and political education into high school biology courses is crucial for educational development and enhancing students' comprehensive qualities. By merging course content and innovative teaching methods, an effective combination of knowledge and value guidance can be achieved, fostering students' scientific literacy and moral qualities. Key strategies include identifying ideological elements in textbooks, designing thematic teaching units, incorporating current events, promoting interdisciplinary integration, conducting project-based learning, and using multimedia resources. Implementation faces challenges in technology, teacher proficiency, student engagement, and school management. Technological issues involve inadequate equipment and support. Teachers face varying IT proficiency and heavy workloads. Students may show low participation and self-discipline, with significant learning ability differences. School management may lack support for Internet+ ideological education and have imperfect systems. Solutions include enhancing infrastructure, providing technical and teacher training, reducing teacher workloads, boosting student interest, offering personalized instruction, and improving management systems. These strategies can effectively promote ideological education in biology courses, increasing student engagement, improving teaching quality, and fostering scientific literacy and social responsibility. Ongoing research and refinement are needed to adapt to educational development and cultivate talents that meet new era demands.

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