

# Exploration on Integrated Teaching Mode of Geomorphology and Geography Under the Background of Intelligent Education

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**Abstract:** Under the rapid industrial development, the requirements for talents have become diversified and comprehensive, resulting in higher requirements for the teaching methods and quality of colleges and universities. Taking the geomorphology and geography courses as an example, teachers need to make effective reform and innovation according to the existing problems, so as to cultivate high-quality comprehensive talents to meet the requirements of the industry. Therefore, an in-depth study was carried out on the teaching reform strategies of geomorphology for geography major in normal universities to provide reference for relevant teachers.

**Keywords:** Intelligent education; Integrated teaching; Educational mode; Geomorphology course; Reform strategy

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## 1. Introduction

Advances in mobile web and emerging information technologies such as artificial intelligence and big data have driven the development and application of smart teaching. In 2018, the Ministry of Education of China launched the “Education Informatization 2.0 Action Plan” and proposed the “Smart Education Innovation and Development Action,” which comprehensively applied intelligent information technology in the field of education, provided a room for imagination and rich forms of expression for education and teaching, and it has become crucial to train first-class talents through intelligent education <sup>[1-3]</sup>. In this era, improving education and teaching quality and innovate talent training mode with the help of intelligent teaching environment, platform, and tools has become an important issue in education reform <sup>[4-6]</sup>.

Earth sciences involve the study of the material composition, internal structure, and evolution of the Earth, and the vast expanse of nature is the best classroom for studying geology. At present, the teaching method of earth science is mainly conducted by PowerPoint presentation combined with oral explanation by teachers, which is not enough for abstract geosciences theories and phenomena, and it is difficult to achieve the expected teaching effect <sup>[7-8]</sup>. The development of smart education integrates information technology into classroom teaching, organically combines online and offline teaching, integrates the advantages of classroom teaching with the individuation and diversification of online teaching, which is an effective way to improve teaching quality and makes the design and implementation of Sunac smart teaching model the key to intelligent courses <sup>[9-10]</sup>. Based on this, this paper takes geology courses as an

example to innovate the training mode by reconstructing the teaching environment, providing open education, and promoting intelligent teaching, so as to provide reference for improving the teaching quality of geography science majors.

Geology and geomorphology courses are basic professional courses offered to geography majors of normal universities. The purpose of the course is to develop basic knowledge and skills of geology and geomorphology, so as to lay a solid foundation for other geography courses. Therefore, the teaching quality of Geology and Geomorphology is directly related to the students' professional skills and comprehensive literacy<sup>[11]</sup>. Therefore, teachers should attach great importance to this course, and constantly strengthen and innovate teaching methods on the basis of solving existing teaching problems, so as to continuously improve the teaching quality and produce more high-quality geography talents.

## **2. Problems in the teaching of geomorphology and geography courses in normal universities**

### **2.1. Backward teaching concept**

In the teaching of geomorphology and geography courses in normal universities, the idea that teachers are the main body of teaching, in which they instill knowledge to students is still adopted. Under such a teaching concept, students only passively receive knowledge, which leads to their low enthusiasm for learning. Besides, the teaching methods adopted are very simple, where it only involves using multimedia to explain electronic courseware, which leads to the boring classroom atmosphere and the low learning quality of students.

### **2.2. Insufficient credit hours**

Due to the lack of emphasis on geomorphology courses in normal universities, the teaching hours and credits for this course are very few. In this way, students need to learn a lot of knowledge in a few hours, which not only increases the learning pressure of students but also leads to the failure of students to thoroughly understand relevant knowledge. At the same time, due to the scarce credit, many students do not pay much attention to this course, which also causes the problem of low quality of geomorphology teaching.

### **2.3. Outdated teaching materials**

At present, the textbooks used for geomorphology courses of geography major in many normal universities are *Geomorphology Course* written by Yang et al. and *Geomorphology* edited by Yan et al., which have been used for more than ten years and are very outdated. In fact, many of the knowledge points are even out of the current geomorphology research. In this way, the teaching quality of geomorphology courses in colleges and universities cannot be effectively improved.

### **2.4. Poor practical lessons**

For geomorphology courses, students not only need to learn theoretical knowledge, but also outdoor practical lessons. However, nowadays, due to various factors, schools do not pay much attention to students' practical teaching. As a result, students cannot carry out outdoor investigation and research. Students can only attend practical lessons in the laboratory. In this way, the quality of students' learning is relatively low because their students' practical learning is severely restricted.

## **3. Teaching reform strategies of geomorphology and geography courses in normal universities**

### **3.1. Changing the teaching concept**

The traditional teaching concept of geomorphology courses is no longer applicable in today's education industry where students are becoming the main body of teaching and multi-disciplinary integrated teaching

is increasingly enhanced. The current teaching concept is not conducive to the improvement of students' learning quality and the development of their comprehensive literacy. Therefore, under the in-depth implementation of teaching reform, teachers need to actively change the traditional teaching concept. Teachers need to use group learning and other teaching methods to highlight students' role in teaching, so as to effectively stimulate their interest in learning and cultivate their autonomous learning ability, teamwork spirit, and creativity. At the same time, teachers need to integrate knowledge of other disciplines into the lessons, so as to effectively expand students' areas of knowledge, effectively deepen their understanding of the subject, and constantly improve their learning quality and comprehensive quality.

### **3.2. Updating the teaching content**

With the rapid development of society and economy, human beings are confronted with a series of major global issues related to population, resources, environment, and development. Therefore, the teaching of geography in colleges and universities needs to be comprehensive, practical, and technologically advanced so as to better serve others and help protect the environment <sup>[12]</sup>. In order to adapt to the requirements of the current development, the content of geomorphology and geography courses in normal universities needs to be reformed and updated. Firstly, the content of geomorphology course should be well-linked to the geography knowledge of middle school, so as to help students learn better. Meanwhile, it is necessary to add some contents of environmental protection, rural geography, geographic information system, and remote sensing to strengthen their geographical literacy. Besides, some of the latest geomorphology scientific research need to be introduced, so that students can fully understand the status of social geomorphology development. Finally, teachers need to introduce some global geomorphic problems in the classroom for students to learn and discuss, so as to effectively enrich their learning content and strengthen their knowledge application and construction. Therefore, through updating the teaching content in various aspects, students can keep up with the times in terms of knowledge, thus laying a solid foundation for future knowledge application.

### **3.3. Reforming of teaching methods**

The teaching methods adopted are directly related to the improvement of students' learning quality and the cultivation of comprehensive literacy. In the new era, the traditional teaching method is no longer suitable for geomorphic courses. Teachers need to integrate the learning characteristics of students and the nature of geomorphic course to effectively carry out the reform of teaching methods. Geomorphic course teaching needs to be practical, comprehensive, and applicable, so teachers can use a variety of methods and means to guide their students. Firstly, teachers can come out with questions after explaining basic theoretical knowledge, so that students will have a better understanding and develop thinking skills. Then, teachers can use case studies and organize group discussions, so as to effectively improve students' autonomous learning ability and cooperative consciousness. Finally, teachers can use multimedia teaching or micro-class teaching with videos and pictures to effectively stimulate students' interest in learning and strengthen their understanding of relevant knowledge. In a word, teachers need to effectively innovate and reform teaching methods, so as to find out creative, efficient, and suitable teaching method to guide students, so as to effectively cultivate students' comprehensive quality on the basis of constantly improving students' learning quality, so that students can grow into a high-quality comprehensive geography talent.

### **3.4. Strengthening teaching practice**

Explaining the theoretical knowledge alone is insufficient in the teaching of geomorphology courses. Teachers also need to strengthen the practical teaching, and the practical teaching of geomorphology course includes two parts: indoor experiment and fieldwork. For laboratory experiments teachers need to

strengthen students' cognition and identification of common minerals, rocks, and paleontological fossil specimens; the practical teaching content of this part can be strengthened by upgrading laboratory facilities. As for fieldwork, it is necessary to solve the problem of insufficient funds through the combined efforts of the school, the department, and the students, so as to create more opportunities for students to practice in the field and master the relevant skills. In this way, teachers can significantly improve students' knowledge application ability and skills, so as to further enhance their learning quality.

### **3.5. Implementation feedback**

With goal of being student- and output- oriented, through reconstructing teaching environment, innovating learning mode and updating teaching resources to optimize teaching and improve the quality of talents, the immediacy of communication between teachers and students is an important part of whether the advantages of integrated teaching mode can be maximized.

It was found that when evaluating the effectiveness of integrated curriculum implementation, the principle of "apply, evaluate, then popularize" is generally followed. From the perspective of teachers, students, and schools, the evaluation is based on the principle of "use first, evaluate later." For the students, the provision of pre-course materials improves students' learning initiative; group discussions improve students' participation in class, and the completion of test questions provides a way to reflect on the learning results. From the teacher's perspective, the collection of teaching materials improves their retrieval skills; the use of new teaching methods promotes their teaching skills, and the use of information technology in teaching also improves their operational skills. From the school's perspective, the platform built by the implementation of blended teaching enriches the school's teaching resources and provides novel cases of curriculum teaching design. Besides, with the help of intelligent platforms in teaching, the real-time database of teaching can be established, and the data of students' learning process is recorded through multiple channels. With big data technology, the learning progress of students, comprehensive evaluation, course counseling, and academic planning can be monitored in real time, and visualized data is provided to provide support for teaching analysis, reflection, meetings, and feedback.

### **4. Conclusion**

The macro structure of the curriculum and the essence of the teaching concept needs to be fully understood. Besides, teachers should innovate their own teaching concept, make it clear that the purpose of education is to cultivate a well-rounded person, overcome the disadvantages traditional teaching, sort out the curriculum from a macroscopic perspective, extend and expand the teaching content, dig deeper into key knowledge points, and ensure that students can grasp the essence of the subject.

At present, students mostly rely on online classes and multimedia, with obvious digital and mobile features, while the emergence of smart teaching shifts learning methods towards smart learning. Vocational colleges should adhere to a student-centered teaching philosophy, adjust the curriculum structure, provide multiple classroom formats, compress in-class credit hours, and implement process-oriented evaluation methods. In this way, the student's participation in the classroom will increase and their learning initiatives will be stimulated.

Further research should be done on teaching methods and teaching process improvement. Teachers should carefully design their lessons according to the students' learning characteristics and the type of intelligent resources, choose appropriate teaching methods, and change the simplistic way of learning. To make it clear that teaching is for learning, teachers should focus on the practical training as well as student-teacher interaction in the design of lessons. Besides, it is also crucial to develop the students' geographic thinking skills and creativity, focus on students' emotional development, and provide students with teaching services that are up to date.

The reconstruction of teaching contents should be emphasized. Teachers should understand the intrinsic meaning and significance of the collection, organization and configuration of geography online resources in many aspects and delineate the types and scope of those resources. Teachers should analyze the actual needs of students based on their learning progress, and acquire the online resources needed, so as to make the teaching content more in line with the learning characteristics of students. In this way, the interest and enthusiasm of students in geography can be significantly increased, which will in turn improve the quality and efficiency of geography teaching and accelerate the students' personal development.

In a word, for geomorphology and geography courses, teachers need to carry out teaching reform in response to existing teaching problems. In the process of reform, they need to keep up with the times and fully consider the characteristics of students and courses. In this way, on the basis of constantly improving the learning quality of students, the students will develop into a comprehensive and high-quality talent.

Smart education brings about intelligentization of teaching concepts, diversification of educational methods, and data-based assessment methods, as well the intelligentization of the learning environment. Taking geomorphology and geography courses as an example, the student-centered teaching concept can be implemented, and the teaching feedback can be given through an intelligent teaching mode, and reflections and seminars can be held. Intelligent teaching should be the core element of talent cultivation and a student-oriented innovative talent cultivation model should be built for geography majors. The deep integration of modern technology and traditional classroom should be explored, and the teachers should be proficient in using technology and be innovative in all aspects. Lastly, the concept of talent cultivation should be transformed to improve the quality of education and talent cultivation.

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## **Disclosure statement**

The authors declare no conflict of interest.

## **Author contributions**

Zhang Chenguang and Niu Jiqiang conceived the idea of the study. Zhang Chenguang, Liu Yize, Liu Minghua, Li Xiumei, Shi Xingjun, Li Zongmeng and Duan Na wrote the paper.

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