

Integrating the Subject Knowledge Learning to Field Trip to Elevate the Practical Purpose of Field Trip Exploration

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Abstract: *This paper will explore how to effectively integrate subject knowledge learning into field investigation and improve its practicality. By analyzing the relationship between field investigation and subject knowledge learning, this paper proposes integration strategies and explores ways to improve students' practical ability, strengthen teacher-student interaction and cooperation, and use modern scientific and technological means. The study aims to optimize the field investigation teaching model, promote the combination of students' theory and practice, and provide useful reference for future practical teaching.*

Keywords: *Field investigation; Subject knowledge learning; Practical improvement; Teaching strategy; Practical teaching*

1. Introduction

In today's educational context, field trips, as a practical learning method, are of great significance for cultivating students' comprehensive qualities. However, traditional field trips often focus on the observation and experience of the natural environment, ignoring the deep integration with subject knowledge. Therefore, this article will explore how to effectively integrate subject knowledge learning into field trips, thereby improving students' practical ability and subject literacy. Through this innovative teaching method, we hope to enable students to deepen their understanding and application of subject knowledge through personal experience, and cultivate outstanding talents with both theoretical knowledge and practical ability.^[1]

2. The relationship between field investigation and subject knowledge learning

2.1. The role of fieldwork in subject education

In subject education, field trips play an important role. It is not only an extension and expansion of theoretical knowledge, but also an important way to cultivate students' practical ability, observation ability and innovative thinking. Through field trips, students can personally experience the practical application of subject knowledge, thereby gaining a deeper understanding and mastery of subject knowledge. The status of field trips in subject education is reflected in many aspects. First, it helps consolidate and deepen students' understanding of what they have learned in class. In the wild environment, students can combine the knowledge they have learned with actual situations and transform abstract theoretical knowledge into concrete practical operations through observation, measurement and analysis.^[2] This transformation process not only helps deepen students' understanding of knowledge, but also improves their interest and motivation in learning. Field trips help develop students' practical abilities. During field trips, students need to use the knowledge they have learned to solve practical problems, which requires them to have independent thinking, teamwork and innovation capabilities. Through continuous practice and exercise, students' abilities will be significantly improved, laying a solid foundation for their future study and work. In addition, field trips can also broaden students' horizons and enhance their overall quality. In the wild environment, students can be exposed to different natural ecosystems, cultural landscapes and social phenomena, thereby broadening their knowledge and horizons. At the same time, field trips can also cultivate students' comprehensive qualities such as environmental awareness, safety awareness and social responsibility, laying a solid foundation for them to become talents with a sense of social responsibility and innovative

spirit.^[3]

Fieldwork has an irreplaceable position in subject education. It can not only consolidate and deepen students' subject knowledge, but also cultivate their practical ability and comprehensive quality, and provide strong support for their all-round development.

2.2. Application of subject knowledge learning in field investigation

In field investigation, the application of subject knowledge is the key link to improve practicality and deepen understanding. Through field investigation, students can combine the theoretical knowledge learned in class with the actual situation in the natural environment, so as to deepen their understanding and application of subject knowledge. On the one hand, geographical knowledge plays a vital role in field investigation. By observing topography and analyzing soil types and hydrological characteristics, students can use the geographical principles they have learned to explain the formation and evolution of natural phenomena. For example, when investigating river landforms, students can use the knowledge of river geomorphology to analyze the erosion and accumulation of rivers and the formation process of river landforms, so as to have a deeper understanding of the characteristics and laws of river landforms. On the other hand, biological knowledge is equally important in field investigation. Through the observation and study of plant species, growth environment and animal population distribution, students can understand the structure and function of ecosystems and grasp the importance of biodiversity. During the investigation, students can also learn how to collect and make animal and plant specimens, master the basic methods of biological classification and identification, and thus improve their practical skills. In addition, the comprehensive application of multidisciplinary knowledge such as environmental science and geology is also a major feature of field investigation. During the investigation, students need to use multidisciplinary knowledge to analyze and solve practical problems. For example, when investigating environmental pollution, students need to use environmental science knowledge to analyze pollution sources and pollution pathways, and also need to use geological knowledge to understand the migration and transformation process of pollutants in the environment.^[4]

The application of subject knowledge in field investigation is multifaceted. It can not only help students deepen their understanding of theoretical knowledge, but also improve their practical ability and problem-solving ability. Therefore, integrating subject knowledge learning into field investigation is of great significance to improving students' comprehensive quality and practical ability.^[5]

3. Strategies for integrating subject knowledge learning into field trips

3.1. Pre-design and preparation

When conducting field surveys, pre-design and preparation are key links to ensure the effective integration of subject knowledge. This step covers many aspects, from clarifying the survey objectives to making detailed plans, and then preparing the necessary tools and materials. Each step is indispensable. First of all, clarifying the survey objectives is the basis for pre-design and preparation. This requires us to determine the theme, scope and focus of the survey according to the characteristics of the subject and teaching requirements. For example, in a geography field survey, we may focus on knowledge such as topography, geological structure, and vegetation distribution. Clarifying the goals helps us maintain direction in the subsequent survey process and ensure the pertinence and effectiveness of learning. Making a detailed plan is the core of pre-design and preparation. This includes the design of the survey route, the arrangement of time nodes, and the clarification of personnel division of labor. When making a plan, we need to fully consider the actual situation, such as weather conditions, terrain complexity, personnel physical condition and other factors to ensure the feasibility and safety of the plan. At the same time, we must also reasonably set observation points and sampling points in the plan according to the requirements of subject knowledge, so that we can fully collect data and information during the field survey. Preparing necessary tools and materials is also an important part of pre-design and preparation. This includes essential tools for field investigations, such as maps, compasses, and measuring instruments, as well as subject-related materials such as textbooks, reference books, and research papers. These tools and materials will provide us with strong support and help during field investigations, enabling us to learn and understand subject knowledge more deeply.^[6]

Pre-design and preparation are key steps to ensure effective integration of subject knowledge learning in field trips. By clarifying goals, making plans, and preparing tools and materials, we can lay

a solid foundation for the smooth progress of field trips and enable subject knowledge to be fully applied and expanded in field trips.^[7]

3.2. Knowledge integration during field trips

In the process of field investigation, field investigation is a key link in the learning of subject knowledge. This link not only requires students to apply the theoretical knowledge learned in class to the actual environment, but also requires them to deepen their understanding and application of knowledge in practice. In the field investigation, students need to effectively integrate the knowledge of multiple disciplines such as biology, geography, and environmental science through personal observation, recording and measurement. For example, when investigating the ecological environment, students can use ecological knowledge to analyze the structure and function of biological communities, and combine geographical knowledge to understand the impact of factors such as landforms and climate on the ecological environment. In this process, students also need to use environmental science knowledge to assess the health of the ecosystem and put forward corresponding protection and management suggestions. The integration of knowledge in the field investigation is also reflected in the process of students collecting, sorting and analyzing data. Students need to use the knowledge of statistics and data analysis to process the collected data and draw scientific conclusions. This process not only exercises students' practical ability, but also improves their scientific thinking and problem-solving ability. In addition, teamwork and communication in field investigation are also important aspects of subject knowledge learning. In the team, students need to give full play to their professional expertise and complete tasks with other members. Through teamwork, students not only learn how to play their role in a team, but also learn how to communicate and collaborate effectively with others.

Knowledge integration in field investigation is an important way to improve the practicality of field investigation. Through this part of learning, students can not only apply the knowledge learned in class to practice, but also deepen their understanding and application of knowledge in practice, thereby comprehensively improving their subject literacy and practical ability.^[8]

3.3. Summary and reflection after the inspection

After the field survey, summary and reflection are the key links to improve the learning effect of subject knowledge. By deeply analyzing the gains and losses in the field survey, we can not only consolidate what we have learned, but also provide valuable experience for subsequent learning and practice. First of all, we need to systematically organize and analyze the data and information collected during the survey. This includes the classification and organization of samples such as plants, animals, and geology, as well as statistical analysis of observation data such as ecological environment and climate change. Through this process, we can have a deeper understanding of the natural characteristics and operating laws of the ecosystem in the field survey area, thereby deepening our understanding and mastery of subject knowledge. We need to reflect on the problems and difficulties encountered during the survey. These problems may include unreasonable planning of the survey route, improper use of observation equipment, and poor communication in team collaboration. By reflecting on these problems, we can find out our shortcomings and think about how to improve them. At the same time, we can also consult other team members or professionals, learn from their experience and skills, and improve our field survey capabilities. In addition, we also need to evaluate the application value of the survey results. This includes combining the knowledge learned with practical problems, thinking about how to use this knowledge to solve practical problems, and how to apply this knowledge to future learning and work. Through this process, we can more clearly understand the purpose and significance of learning, and enhance the initiative and enthusiasm of learning. In short, the summary and reflection after the field investigation is an important learning process. By summarizing experience, identifying problems, and thinking about applications, we can continuously improve our subject knowledge and practical ability, and lay a solid foundation for future study and work.^[8]

4. Ways to improve the practicality of field investigation

4.1. Enhance students' practical ability

In the process of field investigation, it is crucial to enhance the cultivation of students' practical ability. The cultivation of practical ability is not only an extension of subject knowledge learning, but also a key link in improving students' comprehensive quality. First of all, to improve students' practical

ability, we must emphasize the importance of field investigation. Field investigation provides students with the opportunity to directly contact and feel nature, so that they can participate in person and operate hands-on, so as to obtain a more real and profound learning experience. Through field investigation, students can observe the growth environment of organisms, analyze the formation process of geological landforms, and even collect and process field data, which are all direct exercises for students' practical ability. Pay attention to the training of practical skills. In field investigation, students need to master certain practical skills, such as field orientation, survival skills, specimen collection and production, etc. The mastery of these skills can not only ensure the safety of students, but also improve their operational ability and problem-solving ability in practice. Therefore, before field investigation, students should be given necessary skills training to ensure that they have basic practical skills. In addition, students should be guided to actively participate in practical activities. Students should become active participants in field investigations, rather than passive observers. Teachers should encourage students to ask questions and explore actively, so that they can find and solve problems in practice. At the same time, teachers should also provide necessary guidance and support to help students overcome difficulties and challenges in practice. Pay attention to summarizing and reflecting on the results of practice. After the field trip, teachers should organize students to summarize and reflect on the results of practice, let them share their experiences and lessons in practice, and think about how to better apply subject knowledge in practice. Through summarizing and reflecting, students can further improve their practical ability and lay a solid foundation for future study and work.^[9]

4.2. Strengthen interaction and cooperation between teachers and students

In the process of field investigation, it is particularly important to strengthen the interaction and cooperation between teachers and students. This interaction and cooperation not only helps to improve the practicality of field investigation, but also promotes the in-depth learning and application of subject knowledge. As a special teaching method, field investigation emphasizes students' personal participation and experience. In this process, teachers are no longer just knowledge transmitters, but become guides and partners in the students' learning process. The interaction and cooperation between teachers and students makes field investigation no longer a one-way teaching process, but a two-way process of knowledge exchange and practical collaboration. By strengthening the interaction between teachers and students, teachers can timely understand the confusion and difficulties of students in practice, and provide targeted guidance and help. This personalized teaching method helps to stimulate students' interest and enthusiasm in learning, so that they can explore and discover more actively in practice. At the same time, students can also have a deeper understanding of the connotation and application scenarios of subject knowledge through interaction with teachers, thereby deepening their understanding and mastery of subject knowledge. In terms of cooperation, teamwork between teachers and students is the key to improving the practicality of field investigation. In field investigation, teachers can organize students to carry out group discussions, division of labor and cooperation and other activities, so that students can solve problems and share experiences together in cooperation. This form of cooperation can not only cultivate students' teamwork spirit and communication skills, but also allow them to learn in practice how to collaborate with others and how to effectively use resources.

Strengthening the interaction and cooperation between teachers and students is an effective way to improve the practicality of field investigation. Through this approach, we can better combine the learning of subject knowledge with the practice of field investigation and cultivate high-quality talents with innovative spirit and practical ability.

4.3. Use modern technology to improve inspection results

In field investigation, modern scientific and technological means can effectively improve the investigation effect, closely combine subject knowledge learning with practical activities, and thus enhance students' comprehensive quality. Modern technology provides accurate positioning and navigation services for field investigation. Using GPS technology, the investigation team can accurately mark the location of the investigation point to avoid getting lost in complex terrain. At the same time, the application of geographic information system (GIS) can help students intuitively understand geographical information such as topography, vegetation distribution, etc., and provide strong support for subsequent subject analysis. In addition, remote sensing technology has also brought revolutionary changes to field investigation. Through satellite remote sensing images, investigators can understand the macroscopic conditions of the investigation area in advance, including surface coverage, water distribution, etc., providing important reference information for field investigation. During the

investigation, drone technology can efficiently obtain high-resolution image data, helping the investigation team capture subtle natural phenomena and ecological characteristics. Modern scientific and technological means have also enhanced the data collection and analysis capabilities of field investigation. Through smart devices, investigators can record key data such as environmental parameters, biological species and quantity in real time, and use big data analysis technology to deeply mine and organize these data to reveal the ecological laws and subject knowledge hidden behind the data. In addition, modern technology has enriched the teaching methods and content of field trips. With the help of virtual reality (VR) and augmented reality (AR) technology, students can simulate the field trip process in a virtual environment and deepen their understanding and application of subject knowledge. At the same time, these technologies can also be used to build a digital teaching resource library, which is convenient for students to conduct independent learning and exploration anytime and anywhere.

Using modern scientific and technological means to improve the effectiveness of field surveys can not only enhance the practical learning of subject knowledge, but also cultivate students' innovative ability and comprehensive quality, laying a solid foundation for future scientific research and exploration.

5. Conclusions

This paper combines subject knowledge learning with field investigation, aiming to improve the practicality of field investigation. The paper first explains the close relationship between field investigation and subject knowledge learning, and then proposes strategies for integrating subject knowledge into field investigation, including pre-design, knowledge integration during field investigation, and summary and reflection after investigation. At the same time, the paper also explores ways to improve the practicality of field investigation, including strengthening the cultivation of students' practical ability, strengthening the interaction and cooperation between teachers and students, and improving the investigation effect with the help of modern scientific and technological means. This paper summarizes the importance of combining field investigation with subject knowledge learning, and looks forward to the development of field investigation practical teaching in the future. Through the research of this paper, it is expected to provide a useful reference for improving the practicality of field investigation.

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