Journal of Educational Management & Social Sciences (JEMSS)

Volume 3, Number 1, 2022, Pages 1 – 5

Journal Home Page

https://journals.irapa.org/index.php/jemss/

Characteristics Analysis and Teaching Method System Construction of Marine-Related Field Practice

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ARTICLE INFO

Article History:

Received:	January	5, 2022
Revised:	February	10, 2022
Accepted:	April	5, 2022
Available Online:	July	10, 2022

Keywords:

Marine pollution control; Field practice; Integration of science and education; Teaching system

JEL Classification Codes:
O15, O47, R13

ABSTRACT

The experimental teaching process of science and education integration has a profound influence on the cultivation of graduate students' scientific research ability, so we should pay attention to the cultivation of students' field investigation, experiment, and analysis ability, because of the existing problems in the field practice of marine pollution control. It can improve the teaching system by innovating teaching methods, strengthening the construction of teaching materials, promoting the integration of science and education, perfecting evaluation standards, improving the independent scientific research innovation ability of graduate students majoring in marine environment. Based on the field practice of marine pollution control research, this paper analyzes the characteristics of field practice teaching for postgraduate students and explores the construction of a teaching system.

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INTRODUCTION

In recent years, China has been vigorously implementing the strategy of "Ocean Power," building the "21st Century Maritime Silk Road" and developing the marine industry, which provides a once-in-a-lifetime opportunity for higher education institutions to improve the capability of marine pollution management [1]. To cultivate postgraduate students with solid basic knowledge and rich professional knowledge in the marine environment, it is of great practical significance to combine this theoretical course with suitable courses and highlight the advantages of practical teaching.

As a member of the International Federation of Maritime Universities, Dalian Maritime University conforms to the reform trend of universities in the new era. It aims to cultivate professional and technical talents to solve marine pollution problems and maintain maritime ecological safety for China[2]. It has distinctive characteristics in popularizing marine pollution control common sense, imparting professional knowledge, and promoting the construction of a powerful maritime country. The course "Principles and Technology of Marine Pollution Management" was established under such a background, focusing on green navigation.

Field practice has an irreplaceable role in the graduate education of environmental majors with marine characteristics. Therefore, the requirements for field practice teaching are very high. However, the current postgraduate practical teaching attaches importance to knowledge and conclusions. It neglects the experimental process and operational ability, which leads to the lack of innovation consciousness and functional, hands-on ability of students to maximize the benefits of field practice[3]. Therefore, in the context of vigorously developing the ocean, protecting the marine environment and resources, and developing the maritime economy, it is imperative to clarify the shortcomings of the current field practice teaching of graduate students in the marine-related settings, to construct and explore a new teaching system. The new path of talent cultivation formed by the integration of science and education with the premise of innovative talent cultivation and the interpenetration of teaching and scientific research in form and content[4], which can be applied to the practical education of both marine environment-related majors to enhance the scientific thinking ability of students and continuously promote the growth of talents.

PROBLEMS IN THE CURRENT MARINE-RELATED FIELD PRACTICE TEACHING

Insufficient attention to field practice sessions

Although field practice is an essential part of postgraduate teaching, due to objective factors, most domestic sea-related universities do not pay enough attention to field practice, and the phenomenon of "theory" rather than "practice" still exists[5]. Only a few colleges and universities can provide students with two or more times of field practice teaching. Some universities replace field practice teaching with virtual education, video teaching, and simulated observation. The teaching effect is far from the "real" field practice. The weakening of field practice in postgraduate education makes it challenging to improve students' practical ability, innovation consciousness, and comprehensive quality[6].

Insufficient practical teaching conditions

At present, domestic textbooks on marine pollution management focus on introducing principles and techniques. There are few practical teaching materials and mostly guidance on experimental methods, which the students cannot adapt to the field practice teaching in specific regions[7]. At the same time, due to the high requirements of the field practice environment for sea-related majors, it is necessary to equip professional teaching vessels and high-end measuring instruments and equipment for sea-related practice. Due to the limitations of external conditions and insufficient funds, practical teaching in this direction is difficult to realize in most universities. Even if sea-related majors can go to sea, the field of activities is minimal.

Insufficient integration of science and education

The existing teaching methods mostly follow the "teacher lecture-student listening" model, which emphasizes the teacher's lecture and weakens the students' learning and practice process[8]. Teachers talk about the formation of marine pollution phenomena and

countermeasures and lead the team to guide and assign internship tasks. The students completed field practice according to the requirements of the course. Scientific research is not incorporated into teaching, and students only reflect the theoretical level of Marine pollution control with low initiative and enthusiasm[9]. Unable to improve students' scientific research level and ability to analyze and solve problems.

Inadequate assessment framework for innovative practices

At the current stage, graduate students' innovative practice assessment mechanism varies significantly among sea-related universities. The assessment index is not perfect, and the scoring system is incomplete, making the postgraduate students not pay enough attention to practical teaching. Moreover, the courses' teaching plans and time arrangements are more arbitrary. In the long run, it is not conducive to the overall development of sea-related majors[10].

CONSTRUCTION OF A PRACTICAL TEACHING SYSTEM INTEGRATING SCIENCE AND EDUCATION

Innovate practical teaching methods

In the new engineering situation, the teaching content should focus on-field practice, keep up with the frontier of discipline development and the actual needs of information development, and integrate scientific research into teaching practice. Case teaching and exceptional topic teaching are adopted to improve the ability of graduate students to solve practical engineering problems[11]. In practice teaching, teachers should change the teaching mode of passive acceptance by students, make students practice the main body, guide and encourage students to explore independently, stimulate students to think positively and give play to their subjective initiative. Otherwise, Divided students into groups and assigned tasks to study independently. The causes and treatment methods of Marine pollution were analyzed and applied to practical scientific research.

Strengthen the construction of practical teaching materials and conditions

Field practice teaching is a vital link in the teaching process of Marine pollution control. Necessary increase of input, proper planning of practice route, and overall arrangement of practice content can get twice the result with half the effort in improving the teaching quality. Before carrying out field practice teaching, teachers should do a comprehensive and in-depth preliminary investigation and preparation and understand the Marine pollution phenomenon and treatment methods in the practice area. To enrich the teaching content, contact the practice ships or practice bases to provide perfect teaching conditions[12].

Promote the integration of scientific research and practice

Attach importance to graduate students' scientific research practice and strengthen scientific research training. Encourage the student to teach content and subject in combination, plan to inspect experiment content to develop research independently, design management plan, undertake relevant analysis and discussion according to the data obtained and experimental phenomenon, and complete actual subject requirement. The training of scientific research ability is integrated into field practice teaching and combined with basic scientific research projects to form a learning idea of "research status investigation—observation of Marine pollution phenomenon—treatment principle and technology application—discussion and summary."

Improve the examination mechanism of postgraduate innovation practice

Accelerate the improvement of innovation capability evaluation mechanism, pay attention to the diversification of evaluation subjects and the comprehensiveness of evaluation content[13]. For example, teachers can evaluate field island geological exploration practice in route setting, disaster type selection, experimental equipment preparation, field data collection, analysis, mechanism discussion, practical report, and many other aspects. In addition, we will increase disciplinary exchanges with relevant sea-related universities, improve the appropriate assessment mechanism of our graduate students through research, and highlight the characteristics of disciplines and specialties.

CONCLUSIONS

As the deepening and continuation of classroom theoretical teaching, field practice teaching of marine-related courses plays a vital role in cultivating graduate students' professional ability, improving professional quality, and cultivating comprehensive thinking ability. By innovating practical teaching means and methods, strengthening the construction of applicable teaching conditions, promoting the high integration of scientific research and practice, perfecting the examination mechanism of an innovative approach for graduate students, and applying the teaching mode combining ocean characteristics and engineering practice, the quality of field practice teaching can be improved continuously.

ACKNOWLEDGEMENT

This work was supported by the Postgraduate Education and Teaching Reform Project at Dalian Maritime University (YJG2020607).

References:

Han, J. et al. (2018). On the reform of physical geography teaching under the background of change. Education and Teaching Forum, 21, 116-117.

Jiang, L. X. and Wu, Y. Z. (2021). Research on the teaching mode of graduate courses oriented to the cultivation of engineering graduate students' innovation ability. Science&Technology Information, 19, 123-126. doi:10.16661/j.cnki.1672-3791.2105-5042-2627.

Jin, S. F. and Wu, Y. H. (2022). Reform of field practice teaching mode of physical geography in colleges and universities. Theoretical Research and Practice of Innovation and Entrepreneurship, 5, 115-117.

Li, H. L. et al. (2017). On the construction of Marine geology field practice teaching system. Education and Teaching Forum, 26, 121-122.

Li, Y. F. and Ju, Z. J. (2018). Problems and countermeasures in the cultivation of graduate students' innovation ability. Journal of ChongQing Second Normal University, 31, 100-104.

Lin, J. W. et al. (2018). Teaching practice and thinking of "Marine Environmental Protection" course. Education and Teaching Forum, 37, 220-222.

Liu, E. et al. (2021). Construction and exploration of integrated field practice teaching system for Marine science majors. Chinese Geological Education, 30, 118-123. doi:10.16244/j.cnki.1006-9372.2021.04.003.

Liu, H. Q. et al. (2019). Practice teaching reform of Marine science with innovation and entrepreneurship as the core. Journal of Guangxi University for Nationalities (Natural Science Edition), 03, 102-104+108. doi:10.16177/j.cnki.gxmzzk.2019.03.020.

Qiu, K. F. (2019). Practice and thinking of joint field teaching of geology specialty. Chinese Geological Education, 01, 76-79. doi:10.16244/j.cnki.1006-9372.2019.01.022.

Yi, R. R. (2012). Innovative talent training new path. Science News, 07, 54-56.

Zhang, D. et al. (2021). Reform of practical teaching system of Marine Engineering specialty under the new engineering background. Theoretical Research and Practice of Innovation and Entrepreneurship, 4, 51-53.

Zhang, L. et al. (2014). Practical ability training of full-time professional masters in Marine chemical Engineering. GuangDong Chemical Industry, 41, 191-192. doi:10.3969/j.issn.1007-1865.2014.17.103.

Zou, K. X. et al. (2015). Process oriented knowledge value chain based integrated practice curriculum knowledge management. Institute of Curriculum and Instruction, 02, 68-77.