Study on Construction and Operation of National Demonstration Center for Experimental Aqua-Ecology and Aquaculture Education (Tianjin Agriculture University)

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Abstract. The national demonstration center for experimental education is an important teaching base to organize high-level experimental teaching for colleges and universities and to train practical ability and innovative spirit for students. The national demonstration center for experimental aqua-ecology and aquaculture education (Tianjin Agricultural University) is one of the national demonstration centers for experimental aquatic education approved firstly at 2009. We take a series measures, i.e. optimizing the experiment course, updating the content of experiment teaching and increasing experimental hours, to construct the experimental teaching resources. And implementing the director responsibility system, setting up teaching guidance committee and establishing annual report system are employed to perfect management system. And we change our guiding ideology, build an information platform based on the internet and develop various forms to strengthen running open for national demonstration center for experimental aqua-ecology and aquaculture education (Tianjin Agricultural University). After a series of reforms and developments, national demonstration center for experimental aqua-ecology and aquaculture education (Tianjin Agricultural University) plays an important role in improving personality and practice ability, cultivating scientific thinking method, exploring spirit and innovation consciousness for students, and played an exemplary role in promoting the training level of the talents for aquaculture around the country.

Introduction

In order to promote the reform of experimental teaching, to promote the integration and sharing of high-quality teaching resources, and to speed up the implementation of the national innovation driven development strategy, the Ministry of Education of the People's Republic of China (MOE) has proceeded to construct the national demonstration center for experimental education since 2005. At December 2016, the regulation for the national demonstration center for experimental education was published by the MOE, and the following contents were clear, (1) the national demonstration center for experimental education is an important teaching base of high level experimental teaching organized, cultivating innovation spirit and practice ability of students for college and/or university, (2) the national demonstration center for experimental education based on the special college and/or university is constructed as the experimental teaching demonstration platform by MOE.

Tianjin Agricultural University, Huazhong Agricultural University, Shanghai Ocean University, Ocean University of China, Ningbo University and Dalian Ocean University as the construction unit of national demonstration center for experimental aquatic education were firstly approved in 2009,
and then Guangdong Ocean University and the Jimei University were approved to construct the national demonstration center for experimental fishery science and technology education in 2013 and 2014, respectively. From 2009 to now, national demonstration center for experimental aqua-ecology and aquaculture education (Tianjin Agricultural University) adhere to the "talent cultivation as the core, science and technology innovation as the goal, experimental teaching as the foundation", and adhere to the "strengthening basis, broaden the knowledge, cultivate ability, motivate individuality, improve the quality of personality" as the guiding ideology, and adhere to the "imparting knowledge, cultivating ability and improving quality in the process of experimental teaching" as the education ambitions to cultivate practical ability and innovation spirit of undergraduate students for aquaculture and fishery.

MOE and local municipal education commission (MEC) ask to further improve the level of construction of national demonstration center for experimental education, and to play a role in the process of teaching and to develop the regional economy. Based on the actual situation of the school, we update and integrate the experiment teaching resource for national demonstration center for experimental aqua-ecology and aquaculture education (Tianjin Agricultural University), and establish an independent and complete experimental teaching system, and innovate the laboratory management system, and explore the direction of the experimental teaching reform, and share the high quality experimental teaching resources. And the high level of experimental teaching, the perfect management mode and the good operation system is considered very important to culture the high quality talents.

**Experimental Teaching Resources Construction**

The construction of experimental teaching is the base of the developing of demonstration center for experimental education. The experimental teaching resources of national demonstration center for experimental aqua-ecology and aquaculture education (Tianjin Agricultural University) are constructed by optimizing teaching resources, updating the teaching contents, increasing the proportion of experimental teaching hours, and improve the status of experimental teaching and other measures.

By increasing the experimental teaching hours, optimizing course contents, integrating experimental teaching resources, and setting-up experimental course independently, the percentage of the independent experimental curriculum hours for aquaculture, marine fishery science and technology, aquatic science and technology is more than 88%, 78.57% and 83.54%, respectively.

Not only increasing the proportion of experimental teaching hours, but also updating step-by-step the experimental items, adjusting experimental content, reducing the ratio of verification experiments, increasing quantity of the comprehensive innovative experiment, distributing reasonably the ratio of basic experiment, comprehensive and innovative experiment and supporting the students to design and innovative independently experiment project. At present, the comprehensive and innovative experiment based on the national demonstration center for experimental aqua-ecology and aquaculture education (Tianjin Agricultural University) accounted for 42.7% and 10%, respectively, and the amount of innovation experiment project is between 30 and 40.

By breaking the barriers between courses, associating curriculum content, and on the basis of contiguous and cohesive knowledge, the experimental courses are grouped. The basic biotechnology experiment is set, including cell biology experiment, genetic breeding experiment, histological sections and molecular biology experiment. Aquatic animal diseases experiment is set, including disease prevention and control experiment, aquatic microbiology experiment, pathology experiment. And the same to the marine environment experiment, including the water chemistry experiment, fishery environmental monitoring and protection experiment, and marine ecology experiment.
Reformation and Construction of Management System

The management system has a direct impact on the construction and development of a demonstration center for experimental education. National demonstration center for experimental aqua-ecology and aquaculture education (Tianjin Agricultural University) has established a relatively independent management system relying on the college of fisheries, Tianjin Agricultural University. The director's responsibility system under the guidance of dean's office is employed, and the director should be professor at teaching staff, and be responsible for the overall work of the demonstration center. Additionally, deputy director is engaged from all over the college or university. Such management system is built to ensure that the good experimental teaching resources are in the right place.

National demonstration center for experimental aqua-ecology and aquaculture education (Tianjin Agricultural University) sets up a teaching advisory board, which is responsible for the personnel training objectives, experimental teaching system, important teaching reform projects, academic and exchange activities, annual reports and so on. Under this favorable condition, the management system is further improved, the scientific and standardized management of the laboratory is promoted, the quality of personnel training is ensured, personnel training mode is explored, the management system is innovated, and the educational resources are used efficiently.

Strengthening the system construction is necessary for the standardization and scientific management of the demonstration center for experimental education, and is also an important guarantee for the construction of a high level demonstration center for experimental education. With the improvement of the demonstration center construction, a set of pertinent and feasible rules and regulations has been established, which including the experimental teaching management system, the experimental team construction system, and the operation and management system of instruments and equipment. At the same time, improve the laboratory logs, laboratory assistant logs, apparatus logs, and other daily management specifications. In addition, the annual report system of the demonstration center has been established. The basic information of the demonstration center, the main tasks and achievements of teaching, opening and sharing, and annual construction results are collected and posted on the website of the demonstration center.

Opening and Sharing System

The core of opening and sharing system is mainly embodied in open thinking, open platform and open pattern. National demonstration center for experimental aqua-ecology and aquaculture education (Tianjin Agricultural University) integrated educational management platform, micro-course online video platform and practice teaching management platform on the base of the TJAU website (http://www.tjau.edu.cn), and constructed the information management platform of national demonstration center for experimental aqua-ecology and aquaculture education (Tianjin Agricultural University) by using modern information technology, and realized the integration and sharing of various teaching resources and information. Rely on these works, the efficiency and the level of laboratory management and experimental teaching are greatly improved, online teaching resources are enriched, and which provided the appropriate condition for students and self-learners. The demonstration center staff actively propaganda center resources to the teachers and students through the transformation of ideas and ways of working, and show the constructional results of demonstration center to the participants using a variety of learning opportunities. Based on these, the opening and sharing of laboratory and resources for demonstration center are realized.

At the premises of meeting the demands of the teaching, national demonstration center for experimental aqua-ecology and aquaculture education (Tianjin Agricultural University) is open to students to carry out innovative experimental project. At the same time, all the teaching resources are open for the others by training, set up an open day and other forms to disseminate knowledge and service society development.
Conclusion

National demonstration center for experimental aqua-ecology and aquaculture education (Tianjin Agricultural University) was firstly approved by MOE in 2009, and played a leading role in improving the personality and practice ability, training thinking method, cultivating exploration spirit and innovation consciousness for students, and this role is leveling up gradually.

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References


