

# Analysis on Practice of Talents Cultivation Mode Based on the Category-based Enrollment

## --Example by College of Fisheries and Life Science, Shanghai Ocean University

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### Abstract

Taking the progress of category-based enrollment at College of Fisheries and Life Science Shanghai Ocean University as a starting point, this article analyzes the reform initiatives of talents cultivation mode in the context of category-based enrollment launched in the fields of curriculum arrangement and educational resources allocation, and further demonstrates the reform tendency of talents cultivation mode in the comparison of that of similar colleges inland: (A) Optimize the training mode structure and specify requirements for basic knowledge. (B) Scale up the elective credits and enhance the flexibility of talents training mode. (C) Strengthen the practice and promote the internalization of professional skills. (D) Pay attention to professional literacy and reform the way of innovation credits authentication.

**Keywords:** Shanghai Ocean University; Category-based enrollment; Talents cultivation mode; Reformation; Exploration

A number of colleges and universities have tried category-based enrollment in talents cultivation mode reformation

since the 21st century. As the increasing progress of economic and technological level of our nation, the social demand for talents has been showing a tendency of type diversification, standard specification and quality intergration. *The document on undergraduate catalog revision of Regular Institution of Higher Education from the ministry of education*<sup>[1]</sup> cleared that it's necessary to alter the undergraduate education concept overemphasizing professional counterparts in the past, broaden the specialty range and enhance students' social adaptiveness. In the *Undergraduate Catalog and Specialty Instruction of Regular Institution of Higher Education* printed by Department of Higher Education, Ministry of Education in 2012, the number of undergraduate major has dropped to 506 from 635 in 2011 which reduced 20% than the original number<sup>[2]</sup>. In the context of new demand for talents by the nation, the category-based enrollment both facilitates to perfect the talents cultivation system and promotes the self revolution of colleges. While the scientificity of talents cultivation plan will play an important part in talents' quality in the background of category-based enrollment. As aquatic characteristic university who just had his 100<sup>th</sup> birthday,

Shanghai Ocean University is exploring a new road in arrange resources scientifically, optimizing the teaching system, innovating the talents cultivation mode and improving the talents' quality. College of Fisheries and Life Science of our university had been a pilot of category-based enrollment since 2012 and recruited students by categories of fishery science and biology. This article takes the brief profile of category-based enrollment launched by College of Fisheries and Life Science as a point cut, and makes further consideration about deeper reforms of talents cultivation plan through comparison between similar institutions inland, so as to speed up the perfection progress of talents cultivation mode in the context of category-based enrollment in aquatic colleges.

## **1 The brief profile of category-based enrollment progress launched by College of Fisheries and Life Science, Shanghai Ocean University**

### **1.1 Introduction about category-based enrollment majors**

At present the work of category-based enrollment covers all the majors of our college and students are enrolled by two categories that are fishery science and biology. The fishery science of our college has been awarded National Key Discipline, Shanghai University Top-level Discipline (Class A), and the Biology Science of our college has been honored as National Characteristic Major, Shanghai Municipal Education Highland. The college started category-based enrollment as a pilot at 2012 when students recruited by the fishery category were divided into 2 majors of Aquaculture and Aquaculture in Aquatic Animal Medicine and students recruited by biology category were finally divided into 3 majors of Biology Science, Biology Science in Marine Biolo-

gy and Biotechnology. In 2013 the college launched the category-based enrollment in an all-round way when we set 4 majors of Aquaculture, Aquatic Animal Medicine, Aquarium Science and Technology and Animal Science in the fishery category and we set 4 majors of Biology Science, Biotechnology, Marine Biology and Environmental Science in the biology category. The total number of students who benefit from this program closed to 300 this year.

### **1.2 Implementation Measures of category-based enrollment and major choosing**

Following the honesty and science oriented policy, the freshman recruited in our college enjoy the totally same curriculum during the very first academic year, and the college launches the category-based enrollment after students enter the second semester around mid April. The work procedure is as follows. A. To determine the enrollment scale by major. If the number of participants surpasses the budget number, the major can take in 110% of the original quantity at most. B. students fill out application. The intention number students can applicate is the same with the number of the majors which belong to the category. C. To admit students according to their grades. The students who apply for the major as their first choice enjoy the right of priority admission. If the first intention applying students are less than the budget number, the applicants can all be recruited, otherwise the applicants are recruited according to their grades. D. The college makes overall plans and coordinates the students who have not been recruited in the first round between different majors. The students who failed to be chosen by their first intention major will enter their second even third intention major

according to the same grade-based principle.

### **1.3 Supporting works to the category-based enrollment**

1.3.1 Student management follows and put the teacher-student contacting system into practice

The freshmen are organized by category into several classes in the first academic year and each class is supervised by an adviser and a counselor. After the major selection process, students are supposed to study under different major training program and all the education activities will be carried out and organized by majors, meantime new advisers and counselors are allocated for classes in the second year. Besides each freshman is equipped with a tutor with intermediate professional title or above whose responsibility is to take care about students' life and study situation and give a hand as possible as they can. All the teacher-student contacting system including the adviser, the counselor and the tutor will help students to accommodate to the new circumstance and have deeper insight into the goal, the principle and the procedure of major selection work.

1.3.2 Reinforce the freshman education and major selection education

In order to help freshmen to deepen understanding about teaching affairs including the category-based enrollment system, the university pays great attention to the freshman education, and the Office of Teaching Affairs informs the college to arrange a freshman education lectured by the discipline leader and a teaching affair management education lectured by the academic staff within the first week of class. In addition, the college makes a detailed plan for the freshmen welcoming and education, and the advisers and counselors launch entrance education for many times. The core teachers and senior professors such

as department heads, heads of teaching and research sections, discipline leaders make lectures to promote deep major cognition right before freshmen are going to make major selection which fosters students' acquaintance with the major and professional teachers, so as to facilitate them to make rational options when filling out the intention sheet.

### **2.The reform practice of talents cultivation plan in the context of category-based enrollment**

According to the demand of the new major norms, the college adjusted the talents cultivation system in the respects of curriculum setting and teaching resources allocation.

#### **2.1 Enhance the basic education and highlight the discipline advantage**

In the old teaching plans, the time for students to get touch with professional courses is after the 3<sup>rd</sup> semester and that of professional core courses is around the 5<sup>th</sup> semester. Take the students of aquaculture as example, they get touch with the courses of *Culture and enhancement of fish* and *Aquatic animal diseases* after the 5<sup>th</sup> semester. In order to change the situation of getting into the profession too late, understanding the profession too shallow, interesting the profession too thin, the department heads added into the talents cultivation plans in fisheries and biology categories at the first semester professional introductory courses of *Aquatic science introduction* and *Life science introduction* that are cooperated by several senior professors with profound academic accumulation and solid basic teaching skills who gives lectures of 1-2 hours everyone. Under the influence of systematic professional knowledge and the enlightenment of real production and scientific research cases, the students are motivated to be curious about the profession and science exploration, further understand and grasp profes-

sional knowledge, keep enthusiasm and keen interest in professional study. The teachers of the introductory courses reflect that the instructional effects are fine and students are quite active in class and they think more and ask more which can effectively deepen their cognition about professional connotation.

### 2.2 Strengthen professional courses and emphasize to individualized instruction

Due to the radiation effect of the core disciplines and quite long time for talents cultivation plans to be largely revised, some professional core courses didn't present professional characteristic very much. After the category-based enrollment was launched, the professional property of core courses is specially highlighted on the basis of solidifying scientific liberal education. Take the major of Environment Science as example(see table 1), we not only emphasized the environmental property of some core courses but also appropriately extended the credit and hour of that and increased students' engaged time in learning professional skills. After that students' professional knowledge became deeper while keeping knowledge breadth the same. In numbers of innovation and entrepreneurship activities and competitions which is universally participated, the differentiation and diversity of professional courses provide a firm knowledge assurance and intellectual support which will help students to present wisdom in different professional branches and carry out in-depth exploration.

Table 1: The core courses adjustment of environment science major after category-based enrollment

Course Module	Course name	Adjustment
Professional basic compulsory	General Ecology	Change into Environmental Ecology
Professional basic compulsory	General Biology B	Change into Environmental Biology
Professional basic compulsory	General Biology Experiment	Change into Environmental Biology Experiment
Professional basic compulsory	Environmental Evaluation	Increase the hour to 48 and the credit to 3
Professional direction elective	Environmental Toxicology	Increase the hour to 36
Professional direction elective	--	Add Environmental Edaphology and Wetland Ecology
Professional relative elective	--	Add Environmental Biotechnology, Marine Environment, Invasion Ecology ,Ecological Planning and Management
Professional practical compulsory	Ecology Practice	Change into Environmental Ecology Practice

### 2.3 Integrate teaching resources and perfect curriculum system

After the category-based enrollment was implemented, the college integrated the core forces of discipline instruction, enriched relative professional teaching resources and perfected the professional curriculum system. Take the fishery science category as example, the aquaculture curriculum system supported by respects of water, breeding, bait and disease prevention shared some similarity with that of other majors which also belong to the fishery science category, however it didn't cover all the core courses or characteristic courses of those majors. On one hand, the core or characteristic courses of one major has limited audience, it's going to promote the utilization maxi-

mization of Excellent Courses or high quality teaching resources; on the other hand, the integration of excellent resources benefits to further perfection of professional curriculum system from which students can reinforce foundation, expand outreach and increase enthusiasm of the profession. In our reform, the courses of *Feed analysis and testing*, *Feed processing technology and equipment*, *Feed hygiene*, *overview of nutritional immunology* which belong to the Animal Science and the course of *Animal Micro-ecology* which belongs to the Aquatic Animal Disease were added to the talents cultivation plan of the Aquaculture, and all these courses have a positive and realistic significance for elevating professional skills and broaden employment channels for students.

#### **2.4 Adjust curriculum construction and synchronize basic courses of the category**

According to the demand of category-based enrollment mechanism, the talents cultivation plans of all majors in the category should be totally same in the first academic year which is the necessary foundation to implement category-based enrollment and distributary cultivation. Therefore the college checked and adjusted relative parts of talents cultivation plans according to the work demands of category-based enrollment. The cultivation plans of majors in the same category shared nearly the same curriculum in the first year by comparison and only several introductory courses should be placed to the 3<sup>rd</sup> semester. For example, we moved *Introduction to Environmental Science* to the 3<sup>rd</sup> semester from previously the 1<sup>st</sup> semester and after that we updated the course outline which highlighted its professional characteristic.

### **3. The reform orientation of talents cultivation plan under the category-based enrollment**

The category-based enrollment implementation is just starting out in the College of Fisheries and Life Science, Shanghai Ocean University, thus it's urgently needed to further explore and practice the perfection of talents cultivation plan. In the coming days we need to optimize the structure, spark inspirations, determine the details in the revision work of talents cultivation work so as to make it serve the institutional demand of talents cultivation in category.

#### **3.1 Optimize the plan structure and make clear the basic knowledge requirement**

Before we started the category-based enrollment, the cultivation plans of different majors shared high similarity while it's not low for the similarity of their second year curriculum. In the first two years students mainly study the courses on ideology and policy, foreign language, the computer and IT, military sports, mathematics, chemistry, physics and quality development in which the compulsory take more than 82.5 credits and the electives take 8 credits (therein most courses are opened in the first 2 academic years). In other words, the compulsory credits of basic part account for more than half of the total cultivation plan which makes the basic part dominates and weakens the backbone of professional core courses. Therefore it's suggested to arrange the backbone basic courses, stress the subjectivity of core courses when simplifying the basic part and upgrade the pertinency and practicability of basic courses.

#### **3.2 Enlarge the electives and enhance the flexibility of talents cultivation system**

At present there're problems of the compulsory exceeds and the electives goes insufficient in the cultivation plans

of all majors which will necessarily cause the homogeneity of students' professional knowledge system and conflict with the knowledge composition diversity demanded by the career destination diversity. Take the 2013 talents cultivation plan as example, the ratio of the compulsory and the electives is 3.40-3.91 on the whole (see table 2), therein the rations in basic comprehensive module and discipline module are very high where the value of comprehensive module reaches 5.11. In the professional module the ratio of the compulsory and the electives is 2.65-3.03 which means it's permitted to select 1 elective credit in the condition of selecting 3 compulsory credits. From students' perspective there are too much courses to take. Take the sophomore class of Aquatic Animal Disease as example, the compulsory credits that are prefabricated by the Office of Teaching Affairs reaches 38.5 which exceeds the upper limit of 33 credits for every semester regulated by the office, therefore these students aren't permitted to select the electives and their option space is forced to compress. For this reason, it's needed to consider both the knowledge system construction and the knowledge composition diversity, extend the variety and quantity of course provision and reinforce the flexibility of talents cultivation system in the next round of revision.

Table 2: The ratio of the compulsory and the elective in all modules in the talents cultivation plans

Module type	Comprehensive module	Discipline module	Professional module	The total
ratio	5.11	3.35-4.56	2.65-3.03	3.40-3.91

### 3.3 Consolidate the practical part and elevate the internalization of professional skills

From the current cultivation plan, the practical module has only compulsory part containing 3—4 courses whose credit is 10.5-13 and whose teaching period is 21-26 weeks. Except for the graduation thesis with 8 credits launched in the 8<sup>th</sup> semester, the practical courses are all supposed to be opened in the 2<sup>nd</sup> or 3<sup>rd</sup> academic year and most are distributed in the summer short terms at the end of academic year of 2 or 3. Comparing with majors in similar universities inland, there are problems of missing elective practical part, thin credits, low course number, short teaching period in the practical teaching of our college. There are two practical modules of the compulsory and the elective in the Aquaculture in Ocean University of China<sup>[3]</sup> where the compulsory practical part is consisted of 5 courses with 22 credits lasting for 24 weeks and the elective practical part is consisted of 3 courses with 4 credits lasting for 4 weeks. In the comparison we conclude that the species and option diversity of professional practical part can combine with the detailing of practice content and the order-orientation of talents cultivation, thus we will divide *Production Practice* into several aquaculture directions of fish, shellfish, shrimps and crabs for more options so as to fasten the deepening and internalization of students' professional skills.

### 3.4 Pay attention to professional literacy and reform the way of innovation credits authentication

In the cultivation plan of our college, the course of *Innovation and entrepreneurship education* with 1.5 credits is included in the comprehensive module which is launched within the whole university and authenticated by the Office of Students' affair. Actually

the purpose of innovation and entrepreneurship education is to encourage students to carry out scientific innovation and entrepreneurship program connected with their own profession relying professional knowledge and background, hence, the credit authentication should not break away from the profession or the discipline that the students study or be launched incompletely. In the respect of assessment method of the course, it's possible to refer to students' participation situation of scientific program, academic paper, innovation and entrepreneurship competition and social activities. In the respect of innovation and entrepreneurship credit arrangement, there's an obvious gap between other similar universities inland and our school. For example, Ningbo University<sup>[4]</sup> requires students to accomplish 4 innovation credits before graduation, and Ocean University of China sets *innovation education* with 2 credits as a compulsory course and arranges comprehensive innovation skill experiment with 20 hours in the elective module. Only by increasing the emphasis on innovation and entrepreneurship education fundamentally, scaling up the innovation credits, imposing strict assessment mechanism and reforming the way of innovation credits authentication can we promote students' innovative literacy and improve the talents quality constantly.

### **Acknowledgments**

This work is contributed equally by He Shan and Cao Haipeng, in correspondence with Tan Hong-Xin, and financially supported by Program of Shanghai Municipal Education Commission (No. B-5008-13-0003) and 085 project (No. B-5008-12-0101-4).

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