

# Career Planning Education Paths for Students of Aquatic Animal Medicine Discipline in the Context of the Belt and Road Initiative: A Case Study of Construction Achievement of Guangdong Ocean University

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**Abstract** In order to improve the professional competitiveness of students in the Aquatic Animal Medicine Discipline, combined with the case tracking and theoretical practice for aquatic animal medicine students for three years, with the aid of SPSS software, this paper elaborated the actual level and existing problems in career planning of aquatic animal medicine students in Guangdong Ocean University from five dimensions: career planning awareness, self-awareness, environmental awareness, goal planning, and implementation correction. Then, it discussed the opportunities and challenges of the Aquatic Animal Medicine Discipline in the context of the Belt and Road Initiative. Finally, it came up with solutions and reform recommendations in education, teaching, and counseling paths from the students, university, families, government, and society.

**Key words** Aquatic animal medicine, Career planning, The Belt and Road Initiative

## 1 Research background and significance

### 1.1 History of the Aquatic Animal Medicine Discipline

From the birth of China's first fisheries school (Zhili Fishery Training Institute) in 1910 to China officially implementing the licensed fishery veterinary qualification examination system in 2011, it has experienced for more than a hundred years. After China resumed its status as a member of the World Organization for Animal Health in 2007, the aquatic animal epidemic prevention work has received more effective attention. The Aquatic Animal Medicine Discipline is the fourth special discipline under the fisheries first-level discipline and state-controlled second-level discipline clearly approved in the Jiao Gao[2013]No.4 file issued by the Ministry of Education on March 28, 2013. Then, Guangdong Ocean University immediately accelerated the exploration and construction progress of the Aquatic Animal Medicine Discipline, and started to formally recruit undergraduates in 2016. With the transformation of fisheries education from fisheries schools to fisheries colleges and universities to ocean colleges and universities, the birth and development of aquatic animal medicine has provided an objective guarantee for stable and high production of aquaculture industry, and safety of aquatic products, and even health and sustainable development of human beings and the ecological environment.

### 1.2 Consistency of training goals of the Aquatic Animal Medicine Discipline with the Belt and Road Initiative

The training goals of the Aquatic Animal Medicine Discipline in

Guangdong Ocean University are as follows: cultivate high level scientific and technical personnel with comprehensive development of moral, intellectual and fitness level as well as in their appreciation of aesthetics, grasping the knowledge of aquatic animal pathology, having the ability to diagnose and prevent aquatic animal diseases, knowing the advanced technology and frontier research in aquatic animal medicine, and being competent in quality control, production and management, technological innovation, new product research and development in aquaculture production, fishing medicine and bait additive enterprises, and competent in aquatic animal medicine, aquatic animal quarantine, aquatic animal product safety, environmental and aquatic animal protection, scientific research, teaching and management in fishery medicine, fishery medicine business department, fishery production unit, and related departments.

As the world's largest aquaculture country, China is experiencing a crucial period of transformation, restructuring, and upgrade promotion. For this, the aquatic animal medicine is indispensable in the production, service, management, education and research. Countries along the Belt and Road have enormous market demands and development space for inland or coastal water aquaculture. Therefore, the attraction of China's fisheries-related colleges and universities to students of these countries is growing strongly. In addition, the strategy of "bringing in" goes side by side with "going out". More and more powerful domestic aquaculture enterprises are actively expanding their market share in these countries. In this situation, the Aquatic Animal Medicine Discipline with professional qualification will be undoubtedly a strong support to promote the domestic aquaculture enterprises to go out.

**1.3 Necessity for practical teaching of career development and employment guidance for students of Aquatic Animal Medicine Discipline** From the perspective of the overall disci-

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pline setting of colleges and universities, compared with other first-level disciplines, the industry volume and adaptation area of the aquaculture are smaller; the traditional concept of society still remains at the low income and hard working condition of aquaculture industry, leading to few enrollments of aquaculture discipline in recent years<sup>[1]</sup>. This is also a true portrayal of Guangdong Ocean University in a relatively remote area. It must be emphasized that, in 2020, Guangdong Ocean University will welcome the first graduates of Aquatic Animal Medicine Discipline. Whether they can achieve the goal of personnel training directly affects the future enrollment and employment of this new discipline, so it is extremely urgent for the reform and improvement of relevant course setting and practical teaching.

Apart from the professional courses mentioned above, the Students Career Development and Employment Guidance Course (the Innovation and Entrepreneurship Course is included into this category in this paper) is a public compulsory course designed to guide students in recognizing self and career awareness. Students should choose the most appropriate position based on various recognized scientific scales that reflecting their personality, interests, abilities, values and according to social actual needs of the aquatic animal medicine industry. At present, both theoretical and practical studies in the field of career planning for Aquatic Animal Medicine Discipline are relatively scarce. To this end, we carried out a targeted research on all three grades of students from 2016 to 2018 in the Aquatic Animal Medicine Discipline of Guangdong Ocean University.

## 2 Design of the survey and research

**2.1 Framework of the survey and research** Since the research methods and models in other related disciplines have been well developed, combining the case tracking and theoretical practice for aquatic animal medicine students for three years, with the aid of SPSS software, we elaborated the actual career planning level of aquatic animal medicine students in Guangdong Ocean University from career planning awareness, self-awareness, environmental awareness, goal planning, and implementation correction dimensions. Then, we discussed the opportunities and challenges of the Aquatic Animal Medicine Discipline in the context of the

Belt and Road Initiative. Finally, we came up with solutions and reform recommendations in education, teaching, and counseling paths from the student, university, family government, and society.

**2.2 Survey objects and distribution** We adopted a comprehensive survey method to achieve full coverage of all students in this discipline. We surveyed a total of 173 students, including one class of freshmen (2016 grade), two classes of sophomores, and two classes of juniors. Questionnaires were issued by means of Internet hyperlinks and answered anonymously. Each class has a separate time period for answering, and the number of responses in the system background real-time supervision was consistent with the student number of the class. In total, 173 copies of questionnaires were distributed, and both the response rate and valid response rate were 100%.

## 3 Data analysis and results

**3.1 Composition of surveyed objects** Among the surveyed objects, in terms of the gender, there are 91 male students (accounting for 52.6%) and 82 female students (accounting for 47.4%), showing no big difference in the gender. In terms of the grade, the number of freshmen, sophomores and juniors account for 41.62%, 38.15%, and 20.23% respectively. All of these are consistent with actual situations of Guangdong Ocean University.

**3.2 Analysis about current situations of career planning of students in Aquatic Animal Medicine Discipline** In this study, the option of the career planning dimension takes the form of a four-level scale. The options are divided into "very consistent", "consistent", "inconsistent", "very inconsistent", with decreasing scores from 4 to 1. As listed in Table 1, the mean value of overall level of career planning of students in Aquatic Animal Medicine Discipline is 2.141 points. In terms of the mean value of all dimensions, the environmental awareness dimension is the highest, the career planning awareness dimension is the lowest, and the implementation correction dimension is the second lowest. These indicate that although the students in Aquatic Animal Medicine Discipline have a deeper understanding of the environment, they have not realized the importance of the career planning, and they are also very upset about the implementation correction of their own development goals.

**Table 1 Results of analysis about overall level of career planning of students in Aquatic Animal Medicine Discipline**

Name	Sample size	Min	Max	Mean	Standard deviation	Median
Total scale	173	1	3.364	2.141	0.403	2.136
Career planning awareness dimension	173	1	3.000	2.018	0.424	2.000
Self-awareness dimension	173	1	3.600	2.183	0.507	2.200
Environmental awareness dimension	173	1	4.000	2.351	0.659	2.000
Goal planning dimension	173	1	3.750	2.153	0.525	2.000
Implementation correction dimension	173	1	3.400	2.088	0.414	2.000

**3.2.1 Analysis about career planning awareness dimension of students in Aquatic Animal Medicine Discipline.** As the first dimension of career planning, the career planning awareness reflects the degree to which students recognize the necessity for career

planning. Table 2 lists the statistics of each item in this dimension. Combined with the following four tables, it can be seen that this dimension has the largest score difference among the five dimensions. "I need to make career planning now" [www.mana](http://www.mana)

thought about what to do after graduation" even are lower than two points. It shows that the students in Aquatic Animal Medicine Discipline are very weak in the career planning awareness, and also

reflects that the university propaganda and career planning activities are not very effective.

**Table 2** Distribution characteristics of career planning awareness dimension score of students in Aquatic Animal Medicine Discipline

Question number	Question description	Mean	Standard deviation
1	Career planning has a great effect on my development	2.046	0.599
2	I need to make career planning now	1.850	0.529
3	I once actively participated in career planning activities organized by the university	2.289	0.689
4	I once actively went to know some basic knowledge of career planning	2.127	0.625
5	I once thought about what to do after graduation	1.780	0.569

**3.2.2** Analysis about self-awareness dimension of students in Aquatic Animal Medicine Discipline. Self-awareness is an important precondition for making career planning. From the data in Table 3, it can be seen that students in Aquatic Animal Medicine Discipline have no clear understanding of their interests, personality and abilities, and they seldom get to know themselves through various ways, such as making self-analysis, understanding other people's opinions, and conducting psychological tests. As for fish-

ery doctor, students in Aquatic Animal Medicine Discipline are ranked by score as follows; character and temperament are suitable for fishery medicine related work > knowledge structure and ability are competent for a fishery doctor > interested in being a fishery doctor. However, there is little difference in the score, indicating that students in Aquatic Animal Medicine Discipline still have a certain degree of self-awareness.

**Table 3** Distribution characteristics of self-awareness dimension score of students in Aquatic Animal Medicine Discipline

Question number	Question description	Mean	Standard deviation
6	Having clear understanding of their interests, personality and abilities	1.890	0.624
7	Getting to know themselves through various ways, such as making self-analysis, understanding other people's opinions, and conducting psychological tests.	1.879	0.622
8	Being interested in becoming a fishery doctor	2.358	0.792
9	I think my character and temperament are suitable for fishery medicine related work	2.405	0.754
10	My knowledge structure and ability are competent for a fishery doctor	2.382	0.735

**3.2.3** Analysis about environmental awareness dimension of students in Aquatic Animal Medicine Discipline. Environmental awareness is the basis for designing a reasonable career development

path<sup>[3]</sup>. As indicated in Table 4, there is no large difference in the mean value of each item in this dimension, so the environmental awareness dimension has the best performance in all dimensions.

**Table 4** Distribution characteristics of environmental awareness dimension score of students in Aquatic Animal Medicine Discipline

Question number	Question description	Mean	Standard deviation
11	Have once gotten to know current situations and development prospects of fishery doctors through various channels	2.382	0.735
12	Clearly knowing the specific work content and characteristics of occupations related to fishery doctor	2.364	0.707
13	Clearly knowing the employment requirements of occupations related to fishery doctor	2.306	0.668

**3.2.4** Analysis about goal planning dimension of students in Aquatic Animal Medicine Discipline. Setting career goals is a key step in the career planning. However, as indicated in Table 5, the situation is not optimistic. This shows that students in Aquatic Animal Medicine Discipline can not make clear the effective goal.

**Table 5** Distribution characteristics of goal planning dimension score of students in Aquatic Animal Medicine Discipline

Question number	Name	Mean	Standard deviation
14	Setting certain development goals every semester	2.081	0.605
15	Having long-term career goals	2.191	0.641
16	Making a plan to achieve the career goals	2.202	0.619
17	The plan has steps and is operable	2.139	0.574

students in Aquatic Animal Medicine Discipline. The unity of knowing and doing is the precondition for the implementation of career planning. However, as shown in Table 6, the scores of each question are only slightly higher than 2.0, the lowest of which is the twenty-second question, indicating that the students in Aquatic Animal Medicine Discipline regard the career planning as a noun rather than a verb (*i. e.* making career planning). The career planning we advocate is a verb, and is a dynamic combination of the future tense and continuous tense, rather than the past perfect tense. From the overall score of the scale, the scores of none of the questions are at the medium and high levels ( $X \geq 2.5$ ), 18 questions are at a low level ( $2.5 > X \geq 2.0$ ), and 4 questions are even at alert level ( $X < 2.0$ ), indicating that the overall career planning level of students in Aquatic Animal Medicine Discipline is very low.

**3.2.5** Analysis about implementation correction dimension of

**Table 6 Distribution characteristics of implementation correction dimension score of students in Aquatic Animal Medicine Discipline**

Question number	Name	Average value	Standard deviation
18	Well implementing the career planning already made	2.173	0.564
19	Thinking whether the plan originally made is reasonable in the process of implementation	2.040	0.498
20	Making changes to the original career plan with the lapse of time	2.029	0.554
21	Taking the initiative to contact or make friends with some people who are helpful to my career development	2.110	0.575
22	Working hard to learn the relevant knowledge of fishery medicine and improve professional skills	2.087	0.569

### 3.3 Analysis about the differences in career planning of students in Aquatic Animal Medicine Discipline

**3.3.1** Analysis of the effects of personal background on differences in the level of career planning of students in Aquatic Animal Medicine Discipline. The personal background variable consists of the following four aspects: gender, grade, highest educational level of parents, and family location.

(i) Gender. As shown in Table 7, the *P* value of the *T* test of the total scale is 0.001, indicating that different genders of the students in Aquatic Animal Medicine Discipline have significant differences in the level of career planning, and the level of female

students is obviously higher than that of the male students. For each specific dimension, this phenomenon is universal. The reasons are as follows: the aquatic animal medicine industry is affiliated to the aquaculture industry which is recognized as an industry with relatively hard working conditions and needing certain tests and exercises of physical strength. Therefore, employers will inevitably have certain gender discrimination in interviews. Therefore, from the beginning of the entrance of new students, we often advocate that students, especially girls, learn a second major in spare time to increase the negotiation chips in the employment.

**Table 7 T test analysis of the effects of gender on differences in the level of career planning of students in Aquatic Animal Medicine Discipline**

	Gender: (Mean ± Standard deviation)		<i>t</i>	<i>P</i>
	Male (N = 91)	Female (N = 82)		
Career planning awareness dimension	1.96 ± 0.44	2.09 ± 0.40	-2.061	0.041 *
Self-awareness dimension	2.11 ± 0.54	2.27 ± 0.46	-2.130	0.035 *
Environmental awareness dimension	2.21 ± 0.67	2.51 ± 0.61	-3.137	0.002 **
Goal planning dimension	2.04 ± 0.49	2.28 ± 0.53	-3.090	0.002 **
Implementation correction dimension	2.00 ± 0.41	2.19 ± 0.40	-3.089	0.002 **
Total scale	2.05 ± 0.41	2.24 ± 0.37	-3.288	0.001 **

Note: \* denotes  $P < 0.05$ , and \*\* denotes  $P < 0.01$ . The following table adopts the same meaning.

(ii) Grade. As shown in Table 8, the *P* value of the *F* test of the total scale single factor variance analysis is 0.025, indicating that there are also significant differences in different grades. For each spe-

cific dimension, this phenomenon is universal. Besides, with the increase of the grade, the career planning is more mature. Due to the space limitation, the in-depth multiple comparisons are omitted.

**Table 8 Variance analysis of the effects of grade on differences in the level of career planning of students in Aquatic Animal Medicine Discipline**

	Grade: (Standard deviation)			<i>F</i>	<i>P</i>
	Freshman (N = 72)	Sophomore (N = 66)	Junior (N = 35)		
Total scale	0.46	0.36	0.33	3.754	0.025 *
Career planning awareness dimension	0.51	0.33	0.38	8.582	0.000 **
Self-awareness dimension	0.56	0.44	0.51	1.778	0.172
Environmental awareness dimension	0.76	0.56	0.51	5.440	0.005 **
Goal planning dimension	0.60	0.48	0.42	4.340	0.015 *
Implementation correction dimension	0.47	0.38	0.32	4.892	0.009 **

(iii) Family living area. As shown in Table 9, the *P* value of the variance analysis *F* test of the total scale is 0.549, indicating that there is no significant difference in the career planning level

between Aquatic Animal Medicine Discipline students with different family living areas. This is also the same in the multiple comparisons.

**Table 9 Analysis of the effects of family living area on differences in the level of career planning of students in Aquatic Animal Medicine Discipline**

	Family living area before 16 years old: (Standard deviation)			<i>F</i>	<i>P</i>
	City (N = 76)	Town (N = 33)	Countryside (N = 64)		
Total scale	0.43	0.42	0.36	0.549	0.578
Career planning awareness dimension	0.45	0.49	0.34	2.529	0.083
Self-awareness dimension	0.56	0.47	0.47	1.213	0.300
Environmental awareness dimension	0.74	0.68	0.54	1.054	0.351
Goal planning dimension	0.56	0.52	0.49	0.275	0.760
Implementation correction dimension	0.42	0.45	0.39	0.031	0.859

(iv) Highest educational level of parents. As shown in Table 10, the  $P$  value of the variance analysis  $F$  test of the total scale is 0.44, indicating that there is no significant difference in the ca-

reer planning level between Aquatic Animal Medicine Discipline students whose parents have different educational level. This is also the same in the multiple comparisons.

**Table 10 Analysis of the effects of highest educational level of parents on differences in the level of career planning of students in Aquatic Animal Medicine Discipline**

	Highest educational level of parents (Standard deviation)					$F$	$P$
	No education or primary school (N = 21)	Junior middle school (N = 71)	Senior middle school or special secondary school (N = 47)	College degree or bachelor degree (N = 31)	Master degree and above (N = 3)		
Total scale	0.40	0.38	0.44	0.43	0.23	0.440	0.780
Career planning awareness dimension	0.46	0.04	0.45	0.44	0.31	0.545	0.703
Self-awareness dimension	0.58	0.42	0.61	0.46	0.40	2.120	0.080
Environmental awareness dimension	0.62	0.59	0.80	0.61	0.19	1.874	0.117
Goal planning dimension	0.47	0.50	0.52	0.61	0.52	0.864	0.487
Implementation correction dimension	0.43	0.39	0.44	0.43	0.42	0.127	0.972

**3.3.2** Analysis of the effects of personal experience on differences the level of career planning of students in Aquatic Animal Medicine Discipline. (i) Experience of student cadre. As shown in Table 11, the  $P$  value of the  $T$  test of the total scale is 0.023, indicating that there is difference in the level of career planning between Aquatic Animal Medicine Discipline students with the experience of student cadre, while the career planning level of

those without the experience of student cadre is slightly higher than that of those with such experience. It seems to reflect that some students do not take the experience of student cadre as an important experience and get a certain insight from it, but just simply perform the the relevant work. In the dimension of career planning awareness and self-awareness, this difference is more significant.

**Table 11  $T$  test analysis of the effects of experience of student cadre on differences in the level of career planning of students in Aquatic Animal Medicine Discipline**

	Whether you have served as a student cadre during the study in the university (Mean value $\pm$ Standard deviation)		$t$	$p$
	Yes (N = 96)	No (N = 77)		
Total scale	2.08 $\pm$ 0.39	2.22 $\pm$ 0.41	-2.300	0.023 *
Career planning awareness dimension	1.95 $\pm$ 0.40	2.10 $\pm$ 0.44	-2.406	0.017 *
Self-awareness dimension	2.10 $\pm$ 0.51	2.28 $\pm$ 0.49	-2.302	0.023 *
Environmental awareness dimension	2.30 $\pm$ 0.65	2.42 $\pm$ 0.67	-1.239	0.217
Goal planning dimension	2.10 $\pm$ 0.48	2.22 $\pm$ 0.57	-1.596	0.112
Implementation correction dimension	2.04 $\pm$ 0.40	2.15 $\pm$ 0.42	-1.723	0.087

(ii) Social practice experience. As shown in Table 12, the  $P$  value of the  $T$  test of the total scale is 0.022, that there is difference in the career planning level between Aquatic Animal Medicine Discipline students with different social practice experience, while the career planning level of those without the social practice practice is slightly higher than that of those with such experience.

It seems to reflect that some students do not take the social practice experience as a precious wealth and measure the gains and losses from it, but simply do the so-called social practice. In the environmental awareness dimension and implementation correction dimension, this difference is more significant.

**Table 12  $T$  test analysis of the effects of social practice experience on differences in the level of career planning of students in Aquatic Animal Medicine Discipline**

	Whether you have participate in the social practice work related to aquatic animal medicine during the study in the university (Mean value $\pm$ Standard deviation)		$t$	$p$
	Yes (N = 26)	No (N = 147)		
Total scale	1.98 $\pm$ 0.48	2.17 $\pm$ 0.38	-2.307	0.022 *
Career planning awareness dimension	1.90 $\pm$ 0.49	2.04 $\pm$ 0.41	-1.553	0.122
Self-awareness dimension	2.05 $\pm$ 0.61	2.21 $\pm$ 0.49	-1.494	0.137
Environmental awareness dimension	2.08 $\pm$ 0.61	2.40 $\pm$ 0.66	-2.327	0.021 *
Goal planning dimension	1.99 $\pm$ 0.61	2.18 $\pm$ 0.51	-1.724	0.086
Implementation correction dimension	1.91 $\pm$ 0.50	2.12 $\pm$ 0.39	-2.442	0.016 *

**3.3.3** Analysis of the effects of personal ideas on differences the level of career planning of students in Aquatic Animal Medicine Discipline. As shown in Table 13, the *P* value of the single factor variance analysis *F* test of the total scale is 0.010, indicating that there is significant difference in the career planning level between Aquatic Animal Medicine Discipline students with different admis-

sion willingness. Specific to each dimension, only the self-awareness dimension and the goal planning dimension have no difference, and the other three dimensions, especially the implementation correction dimension has extremely significant differences. This is also the same in the multiple comparisons.

**Table 13** Analysis of the effects of admission willingness on differences in the level of career planning of students in Aquatic Animal Medicine Discipline students

	What about your willingness of being admitted by the Discipline (Standard deviation)			<i>F</i>	<i>P</i>
	Strong willingness (N = 26)	General (N = 125)	Having some resentment (N = 22)		
Total scale	0.44	0.33	0.30	4.731	0.010 *
Career planning awareness dimension	0.50	0.38	0.36	3.276	0.040 *
Self-awareness dimension	0.57	0.41	0.44	2.571	0.079
Environmental awareness dimension	0.55	0.55	0.77	3.894	0.022 *
Goal planning dimension	0.55	0.48	0.50	0.653	0.522
Implementation correction dimension	0.47	0.36	0.32	5.391	0.005 * *

**3.3.4** Analysis of the effects of the university aspect on differences the level of career planning of students in Aquatic Animal Medicine Discipline. (i) Course setting of the Aquatic Animal Medicine Discipline. As shown in Table 14, the *P* value of the single factor variance analysis *F* test of the total scale is 0.008, in-

dicating that there is significant difference in the career planning level between Aquatic Animal Medicine Discipline students with different satisfaction with the course setting. This is also the same in the multiple comparisons.

**Table 14** Analysis of the effects of satisfaction with the course setting on differences in the level of career planning of students in Aquatic Animal Medicine Discipline

	Satisfaction with the course setting of the discipline (Standard deviation)			<i>F</i>	<i>P</i>
	Satisfied (N = 42)	General (N = 122)	Dissatisfied (N = 9)		
Total scale	0.49	0.33	0.29	4.973	0.008 * *
Career planning awareness dimension	0.50	0.36	0.46	4.041	0.019 *
Self-awareness dimension	0.57	0.42	0.62	1.562	0.213
Environmental awareness dimension	0.74	0.55	0.78	0.618	0.540
Goal planning dimension	0.59	0.49	0.39	0.793	0.454
Implementation correction dimension	0.53	0.35	0.25	4.402	0.014 *

(ii) Implementation of career planning guiding services. As shown in Table 15, the *P* value of the single factor variance analysis *F* test of the total scale is 0.53, indicating that there is no significant difference in the career planning level between Aquatic

Animal Medicine Discipline students with different satisfaction with the career planning guiding services, but there is significant difference in the career planning awareness dimension. This is also the same in the multiple comparisons.

**Table 15** Analysis of the effects of satisfaction with the career planning guiding services on differences in the level of career planning of students in Aquatic Animal Medicine Discipline

	What about your attitude towards the career planning guiding services (Standard deviation)				<i>F</i>	<i>P</i>
	Very satisfied (N = 8)	Satisfied (N = 58)	General (N = 103)	Dissatisfied (N = 4)		
Total scale	0.45	0.38	0.33	0.48	0.739	0.530
Career planning awareness dimension	0.58	0.42	0.34	0.44	2.721	0.046 *
Self-awareness dimension	0.65	0.47	0.44	0.83	1.711	0.167
Environmental awareness dimension	0.66	0.64	0.58	0.58	0.337	0.798
Goal planning dimension	0.54	0.50	0.46	1.03	1.806	0.148
Implementation correction dimension	0.41	0.41	0.35	0.26	0.383	0.765

## 4 Recommendations for improvement

Through analyzing the above dependent variables in five dimensions, and combining our follow-up observation and typical case analysis of Aquatic Animal Medicine Discipline students for three years, we summarized their problems in the career planning. (i)

The overall career planning ability of Aquatic Animal Medicine Discipline students is very low, the self awareness is lacking, there is no clear and effective goal, the implementation correction ability is much lower, and the career planning awareness is the weakest. (ii) The career planning level of female students is obvi-

ously higher than that of male students, and it shows that the career planning tends to become mature with the increase of the grade, but the situation of the male students is worse. (iii) A large part of the Aquatic Animal Medicine Discipline students do not take the student cadre experience or social practice experience seriously. (iv) Aquatic Animal Medicine Discipline students have no recognition to the discipline and are not very satisfied with the discipline course setting and career planning guiding services. In view of these problems, we came up with solutions and improvement recommendations from the students, university, families, government, and society.

#### 4.1 From the perspective of the students

**4.1.1** Fully realizing the necessity, urgency and scientific nature of career planning for the Aquatic Animal Medicine Discipline. As a non-literary discipline, the Aquatic Animal Medicine Discipline emphasizes agronomy, science, engineering and medicine. Judging from the entrance examination, students registering this Discipline of Guangdong Ocean University generally have poor performance in liberal arts subjects. Due to the influence of lagging cognition such as family and society, the Aquatic Animal Medicine Discipline students take it for granted that the career planning course just preaches and does not need rigorous mathematical calculation, and is not very scientific. As a result, they think the career planning course is not indispensable.

As university educators, we must continue to guide our students to start from the essence of the ancient and modern Chinese and foreign thoughts. We should fully realize the depth of traditional ideas such as those in *Zhongyong* (or *The State of Equilibrium and Harmony*) of *Liji*. "In all things success depends on previous preparation, and without such previous preparation there is sure to be failure. If what is to be spoken be previously determined, there will be no stumbling. If affairs be previously determined, there will be no difficulty with them. If one's actions have been previously determined, there will be no sorrow in connection with them. If principles of conduct have been previously determined, the practice of them will be inexhaustible." We should also recognize that the career planning theory has been developed for more than a hundred years in foreign countries, and foreign scholars have already condensed internationally recognized career planning theories (such as Holland's Career Personality Test scale and action guidance program).

In particular, the Aquatic Animal Medicine Discipline is a new discipline that has only been established for a few years. The Discipline students can't directly refer to the employment situation of many graduates like other old disciplines. Therefore, it becomes more necessary and urgent to make career planning in combination with the Aquatic Animal Medicine Discipline. Especially, male students of the Aquatic Animal Medicine Discipline should make every effort to catch up with female students, and dare to be first and dare to try, to lead female students to develop the career planning in a more scientific manner.

**4.1.2** Comprehensively recognizing themselves with a definite target in view and being confident. Since 2015, most of the disciplines in Guangdong Ocean University (such as aquaculture and marine fisheries science and technology) started the first batch of

enrollment in Guangdong Province. The Aquatic Animal Medicine Discipline was established in 2016, and it was the only discipline not included into the first batch of enrollment in Guangdong Ocean University in that year. Therefore, the Aquatic Animal Medicine Discipline students of 2016 grade may inevitably feel inferior in the same grade students in the Fisheries College. Till 2018, Guangdong Province greatly reformed the admission of college entrance examination, combined the first and second batches of undergraduate enrollment into the "batch of undergraduate enrollment", then the Aquatic Animal Medicine Discipline students of 2018 grade would not have the inferiority complex. It should not be ignored that such inferiority complex caused by this social macro background factor has more or less affected the differences in the evaluation of each dimension of the above grades of students. Otherwise, it will be difficult to understand why this difference deviates from our perception of the career planning level of high and low grades of students in traditional disciplines.

Guangdong Ocean University is neither a university of Project 985 nor a university of Project 211 (Project 985 is a constructive project for founding world-class universities in the 21st century conducted by the government of the People's Republic of China. In the initial phase, 9 universities were included in the project. The second phase, launched in 2004, expanded the program until it has now reached 39 universities. Project 211 is the Chinese government's new endeavor aims at strengthening about 100 institutions of higher education and key disciplinary areas as a national priority for the 21st century. There are 112 universities in the Project 211.) However, In 2015, two disciplines including Fisheries of Guangdong Ocean University were approved as key discipline construction projects of high-level universities in Guangdong Province, and the Fisheries Discipline was approved as a Peak-Climbing Key Discipline of Guangdong Province. In the fourth round of national discipline assessments, the Category Authorized Discipline of Doctoral Degree ascended to the "B -" grade, ranking the 6th of the whole country and the first in Guangdong Province. As a student of the College of Fisheries in Guangdong Ocean University, the Aquatic Animal Medicine Discipline students also share the software and hardware resources of the college's strong faculty and scientific research resources. They can confidently believe that after four years of hard work, they will get the job they want or pursue further education, and even get better career development opportunities with the comparative advantage of the medicine knowledge.

**4.1.3** Making clear effective career planning goal and quantifying the implementation progress self-assessment details. For the career development planning theory, we can roughly analyze the theoretical framework from two aspects ("choice" and "development"). (i) In terms of the "choice", recognized theories include RIASEC (Holland Codes: Realistic, Investigative, Artistic, Social, Enterprising and Conventional)<sup>[4]</sup>, Parsons' Trait-Factor Theory, CIP cognitive information processing theory (including metacognition, CASVE cycle, self-cognition and professional knowledge), and Schein's career anchor theory. (ii) In terms of "development", the general theories include Minnesota's Person-Environment Fit Theory, Super's career development theory,

Roe's psychological needs theory, E. S. Bordin's psychodynamic theory, Gottfredson's theory of circumscription and compromise, and postmodern career theory (including construction theory and narrative theory, *etc.*)<sup>[5]</sup>.

Even with such extensive theories, Aquatic Animal Medicine Discipline students can combine the rules of school education and teaching under the guidance of teachers. They may firstly divide the main development plan of the four years, and then divide the modules according to each semester and then subdivide the small goals according to each month (including the summer and winter vacations). From the above analysis, we can know that Aquatic Animal Medicine Discipline students are not confident and have the inferiority complex, or just leave it to chance. Therefore, we recommend that Aquatic Animal Medicine Discipline students may set the main goals of the first year and second year to use the above mentioned theoretical tools and assessment scales to deeply explore the advantages and disadvantages of their interests, hobbies, personality and abilities, so as to slightly make clear the main path of career development after graduation, and set the third year as a comprehensive test and consolidation period for professional skills (including preparation for the postgraduate study), and finally set the fourth year as the comprehensive sprint (the seventh semester) and the comprehensive fight period (the last semester). Before the last semester, students should strengthen the social practice experience with corresponding intensity, depth, and breadth to test the feasibility of the career planning goals. Such personalized quantitative assessment indicators need to be established and dynamically improved under the one-to-one guidance of the teachers of the Aquatic Animal Medicine Discipline. We will not repeat them in this paper.

## 4.2 From the perspective of the university

**4.2.1** Fully attaching great importance, removing the old and bringing forth the new. According to data issued by the Ministry of Education recently, a total of 416 undergraduate disciplines were canceled in 2018<sup>[6]</sup>, which means that a large number of students have become the last grade of their disciplines. In recent years, it has become a trend that many disciplines are merged or canceled. At the same time, according to the market and social demands, a lot of new disciplines have been established. However, the Aquatic Animal Medicine Discipline should not count on the new discipline, but should make overall planning, advance with the times, attach great importance to the targeted career planning education and teaching, and steadily drive the connotative development.

**4.2.2** Building the career planning education and teaching guiding system for Aquatic Animal Medicine Discipline. According to the data available at present, there is still no special standardized career planning education and teaching guiding system in the universities that have established the Aquatic Animal Medicine Discipline. Different from other disciplines under the fisheries first level discipline, the personnel training program of the Aquatic Animal Medicine Discipline in all universities focuses on the fisheries medicine. Since the nationwide standardized licensed fishery veterinary certification system has been well established, it is urgent to establish the career planning education and teaching guiding system with distinctive characteristics of Aquatic Animal Medicine

Discipline, similar to General Medical Practitioner and normal university student training.

(i) Improving the staffing and improving the performance assessment and academic title evaluation mechanism. In order to ensure the establishment of this system, we believe that the faculty should focus on the following five types of personnel: first, full-time teachers of Admissions and Employment Guidance Center specially engaged in the research of career planning; second, counselors of the corresponding secondary college; teachers in charge of classes of Aquatic Animal Medicine Discipline; experienced alumnus or successful entrepreneur in aquatic products industry, especially senior executives in institutions or entities of countries along the Belt and Road; commercial operation career planning trainers, such as Beisen Education. It is recommended to engage the above experts as the corporate instructors, consultants, and industry class teachers to participate in the construction of career planning for Aquatic Animal Medicine Discipline through the flexible college innovation mechanism established in the university.

Performance assessment should be implemented by combining dynamic tracking and self-reporting, encouraging aquatic animal medicine education workers to forge ahead, develop and innovate, and be dare to try. And it is recommended not to simply use the final success or failure as the sole criterion for achievement identification, so as to urge the public teachers in the system to jump out of their comfort zone.

The academic title evaluation and promotion mechanism should not merely focus on the academic level of core essays, but should fully recognize the objective facts of the majority of colleges and universities' career planning teachers coming from the team of counselors, and jointly formulate the test indicators in line with the objective rules of education, teaching and counseling of aquatic animal medicine; such as the application rate, standard rate and admission rate of licensed fishery veterinary qualification examination and the entrance examination of graduate, and awards for guiding students to participate in the various levels of professional related skills contest, innovation entrepreneurship contest or projects.

(ii) Starting from the student demand and taking the fishery doctor qualification examination system as the guide. At present, the employment guidance services that Aquatic Animal Medicine Discipline want to receive are shown in Fig. 1. From Fig. 1, it can be seen that the demand of employment direction guidance is much higher than other demands, followed by the career planning guidance, employment procedure and skill guidance. Observing this set of data from the perspective of modern education theory that serves students to grow up, we should not ignore this seemingly insignificant comparative data, but should make the best use of the situation, think reversely, higher demand indicates that construction achievements in this regard of Guangdong Ocean University's are worrying. Low demand of psychological guidance reflects the fact that the Aquatic Animal Medicine Discipline students may be too self-enclosed and are not willing to open their mind or Guangdong Ocean University indeed has made significant achievements in psychological counseling education of this field.

Countermeasure 1: the course of Aquatic Animal Medicine



Discipline should be set with reference to the subjects of the licensed fishery veterinary qualification examination<sup>[7]</sup>. As a core course of general education, the career planning education, teaching, and counseling should not be omitted. Instead, it is required to take the licensed fishery veterinary qualification examination system as the guide to break the primary aspects of the above conflicts, and accordingly solve the secondary aspects of the conflicts. According to the new edition of the *Management Methods for Licensed Veterinary Qualification Examination* implemented on July 1, 2017<sup>[8]</sup>, the examination consists of two parts: comprehensive veterinary knowledge and clinical skills. The Veterinary Comprehensive Knowledge Test consists of four subjects: Basics, Prevention, Clinics and Comprehensive Application. The Basics subject include veterinary laws and regulations and professional ethics, which are undoubtedly an important part of the career planning of Aquatic Animal Medicine Discipline. Clinical skills examination includes computer-aided exam and site exam. Relying on National Demonstration Center for Experimental Aquaculture Science Education in the campus and national and provincial and ministerial key laboratories such as East Island Marine Biological Research Base, Freshwater Aquaculture Base outside the campus, the College of Fisheries in Guangdong Ocean University effectively cultivates practical talents with practical operation ability and innovative ability. The aquatic animal medicine career planning education workers should understand the progress of this aspect as much as possible, and promptly discover the career planning related problems such as employment confusion in this process, and give pertinent counseling in accordance with the current situation of social talent demand, and avoid speak just in general terms.

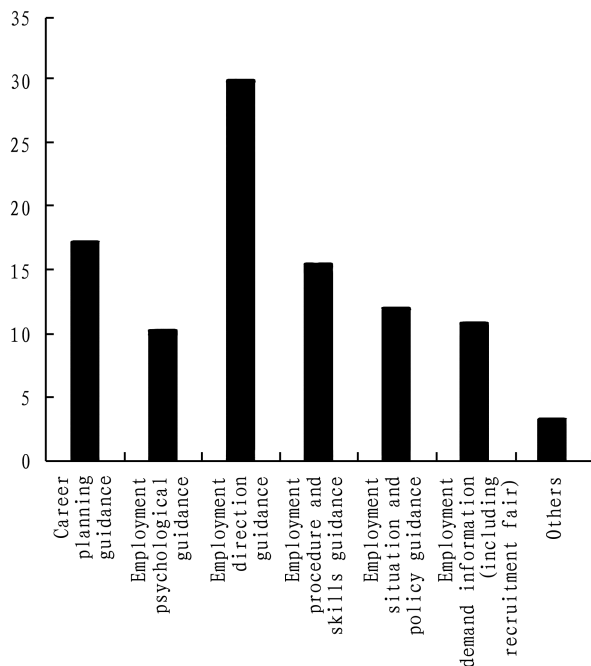


Fig. 1 Employment guidance services Aquatic Animal Medicine Discipline students hope to receive most

Countermeasure 2: actively giving impetus to learning through contest. It is recommended to encourage the professional course

teachers of aquatic animal medicine (including the aquaculture category) and the career planning teachers to complement each other, jointly guide students to participate in the aquatic skills contest, life science innovation and entrepreneurship contest, Internet + innovation and entrepreneurship contest and other public events with high social influence. Especially, it is recommended to encourage Aquatic Animal Medicine Discipline students to cultivate the vision of the big data pattern of the information age, set up a cross-industry dislocation development awareness and explore the media convergence innovation and entrepreneurship platform in the field of aquatic animal medicine. For example, it is possible to take advantage of the achievements of Study of Prevention and Control for Streptococcosis in Tilapia chaired by the team of Professor Jian Jichang from Guangdong Ocean University and awarded as the second-rate prize of Guangdong Provincial Scientific and Technological Progress, to establish Media Convergence marketing platform from the perspective of increasing the market economic benefit transformation rate, or build bilingual work and study service platform for students coming from countries along the Belt and Road (especially those studying in Guangdong Ocean University).

Countermeasure 3: advocating the study through conferences, meetings, seminars, and associations. Every year, every subdivided disciplines of the aquatic industry will hold academic annual conferences, seminars, project promotion associations, *etc.* For example, in the end of last year, the 2018 annual summary meeting of the Belt and Road Tropical National Aquaculture Science and Technology Cooperation Project of the Ministry of Agriculture and Rural Affairs was held in Haikou City, which faces Zhanjiang City across the sea. The meeting once again emphasized that the members of the project team would like to take advantage of the scientific and technological advantages of China's fisheries and improve the scientific and technological level of aquaculture management in the tropical countries along the Belt and Road. The universities should strongly support the professional teachers of aquatic animal medicine (including the aquaculture category) to take students to participate and provide financial support for reimbursement of travel expenses. In particular, China International Aquatic Products Expo and China Marine Economy Expo are often held in Zhanjiang City of Guangdong Province. Thus, Guangdong Ocean University should take such excellent opportunity to organize all Aquatic Animal Medicine Discipline students to participate in various voluntary services of the expos, to directly connect with enterprises and institutions of this new industry and feel the personnel demand criteria and trend of the employers from many aspects in zero distance.

**4.3 From the perspective of the families** Due to the space limitations, we only emphasize the importance of family education and parents' understanding and support for school education. According to many years of observation, it is found that most students of all disciplines in the first-level discipline of fisheries are not very interested in foreign exchange projects such as overseas exchanges, research, and further studies. Taking the College of Fisheries in Guangdong Ocean University as an example, with the strong support of leaders at all levels, we have actively signed various win-win projects for cooperation in running schools and joint

schools with famous foreign universities, but whether they are public, self-funded or combined with a certain proportion of public and self-funded, they fail to really attract the students' attention, and Aquatic Animal Medicine Discipline students are no exception. There are various reasons. But through in-depth conversation, it is known that the main reason is that parents do not give full understanding and support. Therefore, we earnestly ask parents to keep pace with the times, broaden their horizons, and firmly believe that in the context of the Belt and Road Initiative and the positive response of countries along the Belt and Road, provide material and spiritual support for children's external exchanges, which will exert a positive effect on their future!

**4.4 From the perspective of the government and society** In this study, we mainly discussed the career planning education path of Aquatic Animal Medicine Discipline students, but the relevant functional departments of various levels of government (such as the Ministry of Education, the Department of Education; the Ministry of Agriculture and Rural Affairs, the Department of Agriculture; the Ministry of Land and Resources (and State Oceanic Administration for foreign project cooperation of the countries along the Belt and Road), the Department of Oceans and Fisheries, the Bureau of Ocean and Fisheries, the Ministry of Ecology and Environment, the Ministry of Science and Technology, the Department of Science and Technology, and the Science and Technology Bureau) may have great influence on the support (including collaborative innovation, *etc.*) for the Aquatic Animal Discipline. It is hoped that the relevant functional departments can clearly define the objectives, fundamental tasks, teacher qualifications, and assessment standards of colleges and universities' career planning for Aquatic Animal Medicine Discipline, and provide policy guidance in the fields of relevant scientific research projects, so that the career planning education of Aquatic Animal Medicine Discipline becomes more systematic and scientific.

On January 22, 2019, Director Wang Ruijun and academician experts unveiled the plaque of Guangdong Southern Marine Science & Engineering Laboratory (Zhanjiang) and Its Council<sup>[9]</sup>. On the morning of March 30, the unveiling event of the transition period of Zhanjiang Bay Laboratory was held at the Xiashan Campus of Guangdong Ocean University, which marks a substantial step in the construction and operation of the Zhanjiang Bay Laboratory<sup>[10]</sup>. These real policy dividends given to Guangdong Ocean University by the higher authorities are encouraging! It is recommended that a certain proportion of talents with the background of Aquatic Animal Medicine Discipline be scientifically equipped in the marine biology team among the three talent teams in this laboratory to promote the development of the Aquatic Animal Medicine Discipline.

At present, the organizations that have deep cooperation with us include Guangzhou Liyang Aqua-Technology Co., Ltd.,

Guangdong Hongyi Crocodile Industry Co., Ltd., Zhanjiang Lvbaiduo Biotechnology Co., Ltd., and Entry-Exit Inspection and Quarantine Bureau of some cities. It is hoped that the cooperation between employers and fishery related colleges and universities should not stay in traditional disciplines, but should advance with the times and boldly absorb students from the Aquatic Animal Medicine Discipline.

## 5 Conclusions

Career development is changeable as ocean, but no ship is set to sail without the compass or navigation system. The career planning is like the navigation system for career development. As a new discipline, the Aquatic Animal Medicine Discipline needs this more, and it is recommended to update the career planning navigation data for the Aquatic Animal Medicine Discipline. With such ability, students of Aquatic Animal Medicine Discipline can freely shuttle in the countries along the Belt and Road.

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