

# Characteristic Development of Majors in Application-Oriented University Under the Background of "Double First-Class" Initiative

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## ABSTRACT

Under the background of "double first-class" initiative, application-oriented universities should strive to build first-class majors in combination with their characteristics. Based on the analysis of requirements of major construction in application-oriented universities, this paper proposes that characteristic development of undergraduate majors should be combined with existing basic and advantages, development characteristics of industry, focus of regional demand and enterprises need. Furthermore, it should highlight the construction of characteristic major intension, characteristic training mode and characteristic resource conditions. At last, implementation of construction tasks is very critical, such as the talent training mode, curriculum teaching system and professional team, practice teaching environment, operation and management mechanism.

**Keywords:** "Double First-Class" Initiative, Application-oriented University, Undergraduate Majors, Characteristic Development.

## 1. INTRODUCTION

"Double First-Class" initiative, which means to build a world-class university and a first-class discipline, is a major strategic decision in the field of education. Application-oriented universities are an important part of national undergraduate education system, which main serve regional economic construction and train practical professionals [1]. The file from Ministry of Education points out that "Application-oriented undergraduate universities should strive to build first-class majors combined with characteristics".

Therefore, focusing on the goal of first-class major, application-oriented universities should give full play to the advantages, display their strengths in different fields,

and highlight demand traction and practical application. They should adhere to the principle of "I have them when others don't; I have better ones when others have them; I have a new one when others have better ones", and take the road of characteristic development [2].

Characteristics of Majors construction in Application-oriented university

Application-oriented undergraduate education focuses on training and transporting applied talents for development of regional economy, which is obviously different from general undergraduate education [3].

The differences between application-oriented undergraduate education and general undergraduate education are shown in Table 1.

**Table 1.** Differences between application-oriented and general undergraduate education

	General undergraduate education	Application-oriented undergraduate education
Training object	Academic personnel	Practical personnel
Teaching focus	Focus on the primary research in this field, and emphasize teaching of basic theory	Focus on serving frontline of production, construction and management services, and emphasize practical and applied knowledge teaching
Major construction	Be based on discipline construction, and emphasize systematicness and stability	Be guided with economic and social needs, change with practice, and have characteristics of strong directivity and great dynamicity
Service orientation	Serve national economic construction and social development	Serve regional economic construction, provide personnel support for regional economic, and have characteristics of regional and industrial

Therefore, there are two things that have to be done in the process of characteristic development of majors in application-oriented universities.

On the one hand, it is necessary to highlight the differences to general undergraduate universities, and strengthen the characteristics from aspects of application, direction, region, industry and dynamics [4].

On the other hand, it should establish characteristic direction, mode and resources of the majors, based on the basic advantages of our major, the development characteristics of the industry, the regional characteristics focus on demand, and the specific needs of the market and enterprises. Finally, it will form characteristic majors with certain influence and social recognition.

From the current situation of major construction in application-oriented universities, there is still a certain gap with the level of "first-class major". The problems mainly lie in the following aspects [5].

1) *Major positioning is not clear enough.* The distinction between general undergraduate universities and vocational colleges is not enough. Some are too systematic and not enough practical. Some are too practical and practical, the level is not high, and the direction of training talents is not accurate.

2) *Major foundation is relatively weak.* Because the construction time is not long enough and the accumulation is not deep enough, there is a certain gap in the quality of students, teachers, teaching conditions and other aspects compared with the high-level universities. The outstanding achievements are not enough, and the professional influence is not enough.

3) *Major repetition sometimes exists.* With the industry demand and market changes, application-oriented universities set up majors dynamically, which is a certain concentration and clustering. Major characteristics are not obvious and the difference is not big.

4) *Teaching reform needs to be strengthened.* Especially the reform of training mode, teaching content and curriculum system is not deep enough. The construction of applied curriculum system, the

application of practical teaching mode, the application of modern educational technology and information teaching means need to be further strengthened, and the quality of teaching and personnel training needs to be further improved.

The existence of these problems requires application-oriented universities to carry out in-depth demonstration of major construction, strengthen the characteristics of concise, clear construction direction and focus.

## 2. IDEAS AND GOALS

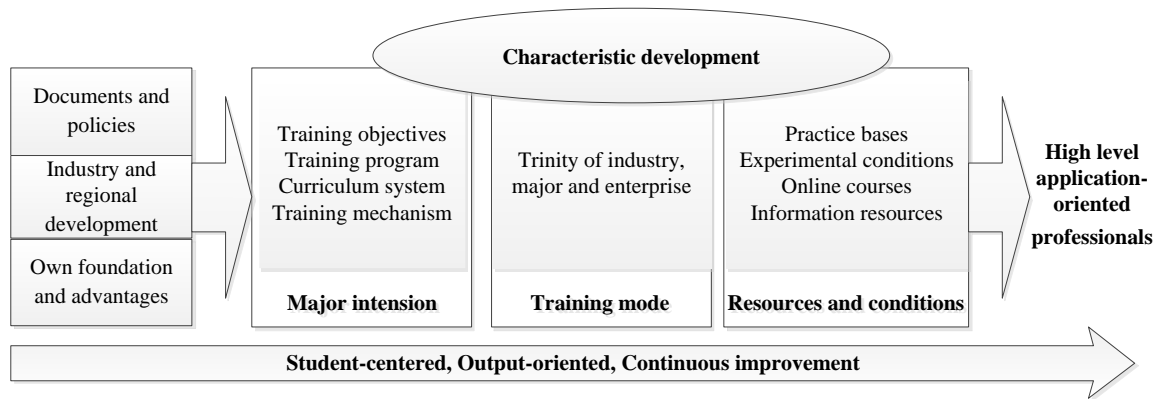
Focusing on the standard of "first-class major", major characteristics are condensed according to the following aspects:

- The guiding documents and policies of major construction, as shown in Table 2.
- Personnel demand for industry and regional economic development. Especially the demand for industry transformation and upgrading, the demand for modern technology (such as Internet +, big data and artificial intelligence), and the demand for regional economic planning, regional characteristic industries and regional special environment [6].
- Own foundation and advantages. We should focus on the long-term accumulation of the specialty construction, focus on the discipline cluster foundation, and find the advantage direction for key construction.

Therefore, the general idea of characteristic development of majors in application-oriented universities is as follows: benchmarking "National Standards for Teaching Quality of Undergraduate Majors ", adapting to the needs of industrial upgrading and regional economic development, establishing the concept of "Student-centered, Output-oriented, Continuous improvement", and highlighting the focus of education objectives, teaching staff, curriculum system and teaching conditions and training quality, so as to build a first-class major with facing the future, adapting to the needs, leading the development, advanced ideas and obvious characteristics, finally achieving the goals to cultivate and transport application-oriented professionals [7]. As shown in Figure 1.

**Table 2.** Guiding documents and policies of major construction

Issuing agency	File name
Ministry of Education	Opinions on Speeding up the Construction of High-level Undergraduate Education and Comprehensively Improving the Ability of Personnel Training
	Guiding Opinions on the Transformation of Undergraduate Colleges and Universities into Application-oriented
	Suggestions on the Implementation of Excellent Engineer Education and Training Plan 2.0 for New Engineering Majors
	National Standards for Teaching Quality of Undergraduate Majors
Education Department of Province	Standards for Special Evaluation of Undergraduate Majors in Colleges and Universities



**Figure 1** General idea of characteristic development of majors in application-oriented universities

In the process of construction, the following ideas and goals should be highlighted:

**2.1. Taking Characteristic Major Intension as the Traction, Clear the Development Direction of Major Characteristics**

Major intension refers to training objectives, training requirements, main courses, employment, and research fields. Major intension represents the essential content and development direction of major construction, and the characteristic of major intension is an important symbol of major differentiation.

The construction of characteristic major intension in application-oriented universities is to find out the weakness of personnel training, and the demand of knowledge, ability and quality structure of employment posts, by analyzing the actual needs of industries, regions and enterprises [8]. It also requires to accurately setting the training objectives and training programs, construct novel and perfect curriculum and textbook system, and form a good linkage mechanism of enrollment, training and employment, so as to make major development closely follow the demand and have distinctive characteristics.

**2.2. Taking Characteristic Training Mode as Main Line, Highlighting Cultivating Personnel Competitive Advantage**

Training mode refers to the total process of implementing education with relatively stable teaching system, management system and evaluation method according to specific training objectives and personnel specifications. Training mode is the embodiment of educational thoughts and concepts, which is composed of training specifications, training process, training system and training evaluation. Characteristic training mode fundamentally stipulates the characteristics of the output personnel, and determines the post adaptability and market competitiveness of the trained personnel.

The characteristic construction of training mode in application-oriented universities is to highlight the applicability and practicality of training, establish "Trinity" concept of industry, major and enterprise, and promote the deep integration of "industry-major-enterprise" around university-enterprise collaborative education, resource co-construction and sharing, and scientific research cooperation [9].

The whole time and space, whole elements and whole process of personnel cultivation are included in the scope of school enterprise cooperation, which makes the cultivation of personnel really meet social needs and have strong competitiveness. Whether the training mode has characteristics or not depends on whether the scope, form and effect of integration (industry-major-enterprise) meet the demand and whether they can innovate flexibly.

**2.3. Taking Characteristic Resources as the Guarantee, Comprehensively Promoting the Reform of Teaching**

Major resources refer to all kinds of human, financial, material and information resources used to support major teaching and personnel training, including teachers, facilities, books and information resources [10]. Major resources are supporting elements of major construction and development, which reflect the overall level of major construction. The construction of characteristic major intension and characteristic training mode needs the support and guarantee of characteristic resources.

The characteristic construction of resources in application-oriented universities is to highlight the practical teaching requirements, which can meet the teaching needs of curriculum application practice, operation skills training, university-enterprise collaborative education and open education. Therefore, it is necessary to highlight the construction of practical teaching bases, improve the software and hardware environment of experimental teaching, and provide practical conditions for the cultivation of applied

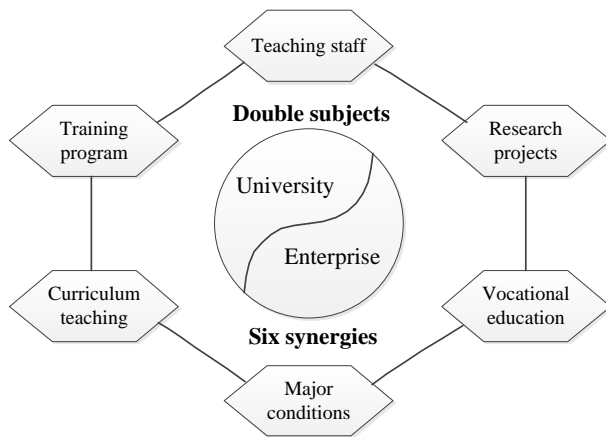
personnel. Moreover, we should highlight the application of modern educational technology, focus on the construction of online open courses, online and offline mixed courses, virtual simulation experiment projects and supporting information resources, so as to form teaching resources with rich contents, diverse forms and open sharing System.

### 3. CONSTRUCTION MEASURES

According to the above ideas and goals, we can focus on personnel training mode, curriculum teaching system, professional teaching staff, practical teaching environment, operation and management mechanism to form the Countermeasures for the characteristic development of majors.

#### 3.1. Training Mode with Double Subjects and Multi Synergies

We should make clear the "double subjects" orientation of university and enterprise, jointly develop teaching resources, jointly construct educational environment, jointly plan for personnel training, and jointly complete teaching tasks, so as to cultivate excellent application-oriented professionals with professional ethics, professionalism and professional skills. It is important to focus on "six synergies". As shown in Figure 2.



**Figure 2** Training mode with double subjects and multi synergies

1) *Promote university-enterprise cooperation in teaching staff.* Promote mutual agency duty, mutual exchange, mutual employment, and work in cooperation with a due division of personnel training.

2) *Promote university-enterprise cooperation in training program.* Promote the perfect connection between industry demand and professional training.

3) *Promote university-enterprise cooperation in curriculum teaching.* Carry out the curriculum teaching and practice training based on the actual work tasks, in

accordance with the requirements of professional standards and close to the real situation of enterprise.

4) *Promote university-enterprise cooperation in major conditions.* Complete the development of curriculum resources and practice bases, and promote co-construction and sharing.

5) *Promote university-enterprise cooperation in vocational education.* Promote the integration of academic certificate and vocational qualification certificate, and effectively connect vocational education and lifelong learning.

6) *Promote university-enterprise cooperation in research projects.* Build a collaborative innovation platform and a collaborative training platform, guide university students' innovation and entrepreneurship activities, and promote practical development of enterprises with innovative achievements to achieve a win-win situation.

#### 3.2. A Student-Centered and Output-Oriented Curriculum Teaching System

Focal points are as follows:

1) *Curriculum system design.* To meet the needs of students' career development, we should strengthen and enhance the proportion of practical teaching courses and innovation and entrepreneurship courses.

2) *Teaching content selection.* Close to the reality of post, close to the forefront of industry, flexible choice based on whether the post is needed or not, and keep updating constantly.

3) *Teaching method reform.* Highlight the central position of students in the teaching process, and apply heuristic, experiential, discussion, participatory and research-based teaching methods.

4) *Application of teaching means.* Change traditional classroom with information technology, highlight the construction of teaching resources such as MOOC, micro-class and flipped classroom, promote the application of Internet and mobile Internet, big data and information network technology in logistics teaching and research, promote online and offline mixed teaching, and expand the coverage of small class teaching.

5) *Course assessment method.* Pay attention to the examination of students' ability to analyze and solve logistics professional problems by using knowledge, explore non-standard answer examination, and eliminate the accumulated disadvantages of "high score but low ability".

6) *Teaching activities.* Adhere to the competition to promote learning, actively organize students to participate in national and regional practice

competitions such as "the national university students logistics design competition", as well as the national college students innovation and entrepreneurship competition and other professional skills competitions, so as to stimulate students' interest and potential with skills competition, and enhance students' ability of autonomous learning, analysis and problem-solving in the competition.

### ***3.3. A Professional Teaching Staff with Double Teachers, Multi Abilities and Echelon Allocation***

Aiming at the highlighting characteristics of "Double Teachers", we should create a major "double leader" team, a backbone teacher team and a part-time teacher team, and build a "double-teacher and multi-functional" teacher staff, which integrate the function of professional teaching, vocational guidance, entrepreneurship education, scientific research and innovation, and technical services. The main initiatives include the following:

- Carry out the system of double major leaders in universities and enterprises, to make the major development always stand at the forefront of discipline and practice.
- Strengthen the introduction and training of backbone teachers, constantly improve the educational background and professional titles, and introduce experts and great master.
- Employ high level and skilled part-time teachers and enterprise tutors.
- Organize teachers to participate in vocational skills training and take temporary posts in enterprises to improve the proportion of "double teachers" among major teachers;
- Encourage and support teachers to participate in teaching and research activities, provide necessary guidance for students' studies, career planning, extracurricular academic and practical activities, and actively use their own achievements to serve the society.

### ***3.4. An Advanced, Open and Shared Practical Teaching Environment***

Comprehensive use of resources inside and outside university, build an experimental practice training platform to meet the needs of practical teaching.

We should strengthen the construction of experimental teaching resources, construct virtual simulation experiment projects, and build experimental teaching platform with advanced technology, intensive function, resource sharing, full opening and efficient

operation to meet the needs of experimental teaching of professional courses.

We will promote the construction of practice education bases with industries and enterprises, effectively strengthen management of practice process, and improve practice education mechanism of win-win cooperation, openness and sharing.

We will build professional innovation and entrepreneurship experimental base and training center, improve innovation and entrepreneurship education practice platform, to meet the needs of students' innovation and entrepreneurship practice.

At the same time, we should make full use of the training teachers and training bases to provide a variety of talents training for the society and improve the social service ability of this major.

### ***3.5. Management Mechanism with Whole Process Monitoring, Multi-Dimensional Evaluation, and Continuous Improvement***

Strictly implement quality standards and teaching requirements of all teaching links, improve the monitoring and evaluation mechanism of professional status data, the mechanism of professional investigation and analysis evaluation, the system of students' evaluation of teaching, the mechanism of helping students with difficulties, and the mechanism of graduates, employers and experts to participate in discussion of training objectives, training specifications and training programs, so as to realize whole process monitoring to the quality of major management.

A third-party personnel training quality evaluation system is established with the participation of students' employment units, industry associations, students and their parents, research institutions. The employment rate of graduates, employment quality, enterprise satisfaction and entrepreneurial effectiveness are taken as important indicators to measure the quality of professional personnel training, and the authority and effective information are taken as scientific basis for teaching reform, improving quality of personnel training, so as to form a multi-dimensional evaluation mechanism for the quality of major construction.

Regular student evaluation and expert evaluation activities are held to timely understand and deal with the problems in teaching. Regular professional evaluation is carried out to solve the problems in the process of major construction, so as to ensure the continuous improvement of major level. Regularly hold consultation activities for graduates and employers, and absorb experts from industry and enterprises to participate in professional teaching guidance, form an effective mechanism to revise and improve training

programs regularly, so as to achieve continuous improvement of professional construction quality.

#### 4. CONCLUSION

Under the background of "Double First-class" initiative, application-oriented universities should combine the characteristics to build first-class majors, and take the road of characteristic development is inevitable choice of their major construction. Based on comprehensive analysis of the basic advantages, the development characteristics of the industry, the demand focus of the region and the specific needs of enterprises, major construction of the application-oriented universities should scientifically establish characteristic direction, mode and resources, so as to form characteristic major with certain influence and social recognition.

The construction of major characteristic includes personnel training mode, curriculum teaching system, professional teachers, practical teaching environment, operation and management mechanism. Different colleges and universities should flexibly formulate and choose different construction measures in combination with their own characteristics development ideas. Thus, a good major layout will be formed, and the high-level application professionals with different characteristics and competitive edge, who can adapt to different job demands, will be cultivated and transported for the society.

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