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Practice and Exploration of "Student-centered" Teaching Paradigm in Application-oriented Universities

-- A Case Study of China Fire and Rescue Institute

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Abstract. "student-centered" is an important dimension to measure the connotative development of China higher education and the transformation in the new era, however the practice of "student-centered" teaching paradigm in application-oriented Universities faces the reality of external environmental obstacles and insufficient internal conditions troubled. Based on the research of the "New Three Centers" teaching paradigm of China Fire and Rescue Institute, it is found that there are differences in learning and application in the transformation result poor actual combat effect, low integration and insufficient teaching experience result lack of motivation, lack of deep understanding and lack of critical awareness. In order to meet the practical difficulties, it is recommended to optimize the course content, implement gender equality, optimize the teaching method, improve the quality of the classroom, optimize the evaluation system, improve the internal drive of the students, consolidate the red gene, and strengthen the ideology and politics of the course.

Keywords: Student-centered; Application-oriented Universities; Paradigm Exploration; Teaching Reform.

1. Introduction

In the 1980s, the United States took the lead in carrying out the "student-centered" undergraduate teaching reform movement. In line with the development background of the transformation from industrial society to knowledge society and information society, the "student-centered" teaching concept has been recognized in the global education circle, and has risen to the mainstream trend of undergraduate education reform and development. Compared with foreign countries, China's "student-centered" teaching concept prevailed late, until the late 1990s, "student-centered" education concept in our country received attention and emphasis. Although the concept of "student-centered" has become the consensus of higher education circles, it has not been fully implemented in the practice of running colleges and universities, and students' learning motivation, learning input and learning effect have not been improved as a whole, which is more prominent in application-oriented University. Application-oriented University are characterized and focused on pragmatic and instrumentalized training, the curriculum system focuses on professional quality rather than comprehensive ability, personnel training tends to be homogeneous and single, and the teacher-centered mode are in contradiction with the mainstream teaching concept of "student-centered", resulting in the lack of endogenous motivation for students to learn, poor talent training effect, and difficult to effectively link up with the real social needs.

Similarly, as an application-oriented university, China Fire and Rescue Institute still faces the troubles of external environment and internal conditions when its teaching concept is transformed to "student-centered". How to systematically construct "student-centered" education and teaching system urgently needs to find a breakthrough path. It is worth noting that different from ordinary application-oriented University, China Fire and Rescue Institute, as an important part of the national comprehensive fire and rescue team, is the first specialized undergraduate fire and rescue Institute in China. Talent training focuses on comprehensive rescue of "all kinds of disasters and major emergencies", and its own characteristics are remarkable, such as free tuition, accommodation and

food for four years of undergraduate study, and monthly stipend. Graduates are distributed according to geographical distribution, and employment is stable. Students avoid the market employment competition mechanism, which makes the dilemma of teaching as the center and teaching more difficult than learning more obvious. In order to ensure the high-quality training and sustainable supply of talents in the industry, under the guidance of the "trainees as the center" education concept in the new era, it is of great practical significance to focus on the industry college, and explore the construction of a new model of "trainees as the center" education and teaching based on the characteristics and advantages of its own positioning, resources and teachers.

2. Connotation and Characteristics of "Student-centered" in Application-oriented University

2.1. Connotation

"Student-centered" undergraduate teaching reform began in the United States, the core is "student development as the center, student learning as the center, learning effect as the center." Subsequently, it was carried out in all colleges and universities in the United States, which is an innovation and development of ideas and teaching modes brought about by the progress of social education technology, and a change from the traditional teaching mode of "textbook centered, teacher centered and classroom centered". At the beginning of this century, our country began to gradually accept this concept of education and teaching. Especially since 2018, Ministry of Education of the People's Republic of China has launched a nationwide battle to comprehensively revitalize undergraduate education, opening a new era of undergraduate education in China. The direction of the reform is to promote the "student-centered" undergraduate teaching reform, focusing on the reform of undergraduate course teaching, in order to create "Golden Course" and eliminate "Blow-off Class" as the standard. This provides a clear direction and way for our country to improve the quality of undergraduate education in an all-round way. This battle to revitalize the quality of undergraduate education in China has caused great repercussions in universities across the country. The concept of "Student-centered" has become the "pronoun" of teaching reform in colleges and universities across the country. The educational circle has explored and practiced such methods as "active learning teaching method", "integrated interactive teaching method" and "efficient mixed teaching method", which has effectively promoted the transformation of teaching mode from "teaching" to "learning" and teaching effect.

However, in the practice of this educational reform aimed at paying real attention to the growth of students, it still has not gotten out of the realistic difficulties of "Teacher-centered", "teaching is more difficult than learning", and "virtual and growth are difficult to integrate" under the traditional educational framework. The realization path of the transformation of schools from "classroom, teacher, teaching material" and "old three centers" to "students, learning, process" and "new three centers" is not clear. In particular, the "student-centered" teaching reform model that conforms to Chinese characteristics and fire rescue is rarely involved in universities. As an industry college specially established by the state to train talents of the national comprehensive fire rescue team, it is imperative to explore the construction of a "student-centered" teaching mode based on the complex and diverse composition of students, uneven knowledge reserve, bias in curriculum cognition, poor combination of theory and practice, and the characteristics and advantages of its own positioning, resources and teachers.

2.2. Features

"Student-centered" is the starting point and ownership of the development of modern application-oriented University, and the development and improvement of educational concepts reflect the realistic needs of contemporary social development. China Fire and Rescue Institute, as the first specialized fire and rescue undergraduate college in China, although it has not been established for a

long time, it follows the law of education and teaching in personnel training. Therefore, the "student-centered" teaching concept paradigm shows the following characteristics:

First, we should pursue fairness and justice. The essence of education is the two-way interaction between teaching and learning, the purpose is to enable the educates to learn knowledge and skills, improve the overall comprehensive ability, in this two-way interaction, if the proportion of educators is too large, it will weaken the effectiveness and role of education. Therefore, "student-centered" is to emphasize the subject status of students in the overall teaching process, fully explore and stimulate students' independent initiative, respect and encourage students' independent innovation. Special attention should be paid to students with special abilities, specialties and wisdom of fire rescue, and a personalized growth environment should be created for their development.

Second, we need to emphasize sustainable development. Different from ordinary application-oriented University that follow the market competition mechanism, students from China Fire and Rescue Institute have stable employment units and career prospects, and provide comprehensive fire rescue teams with talents to meet their career development needs. "Student-centered" is an important embodiment of the concept of sustainable development education. On the basis of upholding the concept of sustainable development education, China Fire and Rescue Institute attaches importance to the value and needs of students themselves, focuses on cultivating students' self-learning ability, practical ability and creative ability, and enhances the adaptability of posts.

Third, we attach importance to students' rights. Different from the traditional concept that students need to suppress in the past, "student-centered" is the affirmation and guarantee of students' educational rights, recognizing that students have the right to fair and just treatment, have the right to fully express their personal pursuit of good education, have the right to get help when they are treated badly, have the right to choose courses, choose teachers, and acquire knowledge. In addition to the reasonable arrangement of professional courses, whether it is the independent choice of elective courses, or the free organization of community activities, China Fire and Rescue Institute reflects the characteristics of attaching importance to the rights of students.

3. Practical Exploration of the Transformation of "Cadet-Centered" Teaching Paradigm in China Fire and Rescue Institute

The "student-centered" teaching concept and paradigm reform of China Fire and Rescue Institute was formally proposed in 2021, but due to its special responsibility and mission, the school has always adhered to the "student-centered" teaching concept, is from the classroom, teachers, teaching materials as the center of the "old three center" to the student-centered development (the purpose is to practice loyalty, mission), the student-centered learning (the purpose is to strengthen quality, enhance ability), the learning effect as the center (the purpose is to perform duties, can be responsible) rapid change.

3.1. Focus on Student Development

Taking student development as the center means that in the training process of students, combined with the specific characteristics of future team positions, the knowledge structure and ability quality of excellent grass-roots commanders and combatants should be summarized, and the content of talent training programs should be constructed. The core is the standard of loyal guards, and the implementation is the requirement of educating people for the Party and educating talents for the country. To this end, according to the students' learning structure, the school accurately locates the learning objectives, and promotes the personalized ability training of students with the modular construction of courses. For different student groups, result-oriented, guide students to combine their professional background and career planning, accurately locate learning goals, and tailor course modules according to different learning goals. To support the students' strategic thinking, business continuous management, knowledge construction, emergency command, emergency technology application, scientific research and innovation, continuous learning and other ability elements or

ability sets of differentiated training. On this basis, according to different contents, appropriate learning methods and bibliographies are recommended for students, so that students can take fewer detours and get more harvest.

3.2. Student Learning as the Center

The essence of student-centered learning is to cultivate students' ability and method of lifelong learning. Teachers focus on "act as a go-betwee", students are "walking the code", combined with modern technical means to acquire knowledge, track professional frontier, and build a scientific knowledge system. To this end, the college adopts the differentiated gradient teaching method. Change the overall promotion mode and build a gradient learning path. In view of the reality that the teaching objects are young students and team students, a gradient approach is adopted in the introduction of courses, formal learning, and the arrangement of key and difficult knowledge. Students who have completed the first stage of learning tasks are allowed to enter the stage of independent exploration of key and difficult knowledge, and students who have not mastered the knowledge of this stage are given some spare time to digest and master the basic knowledge. Face the students' learning reality, improve the teaching promotion entry point. Based on teachers' one-sided questioning and guidance and students' irrelevant questions, group learning is adopted to change the one-way information exchange between teachers and students, break the dull classroom atmosphere, encourage students in the group to help each other, and improve the overall learning efficiency of students.

3.3. Take Learning Effect as the Center

Taking learning effect as the center means that the learning effect is tested in practice through the integrated education method of school and team, the learning effect is reflected in the comprehensive drill, and the ability to perform duties and the spirit of service is demonstrated in the practice of fire brigade and fire station. To this end, the college tries to break through the traditional offline classroom, broaden the teaching form resources, enhance the cutting-edge, pertinence and attractiveness of the teaching content, break through the geographical restrictions, and improve the efficiency of the classroom. For example, Ethiopian scholars in China were invited to explain Ethiopia's emergency rescue status online, which aroused students' enthusiasm for class and deepened their mastery of knowledge points; The first-line commanders and soldiers of the fire rescue team were invited to explain the specific practical problems, which improved the students' ability to use knowledge points.

4. The Practical Dilemma of "Student-Centered" Teaching Reform in Application-Oriented University

In the continuous development of more than 40 years, China Fire and Rescue Institute has transported more than 50,000 emergency rescue talents for the military and civilian areas. After the reform and transformation, as an application-oriented university, the college actively adapts to the needs of the national emergency management strategy, closely focuses on the overall situation of service, close to actual combat, adheres to the "student-centered" teaching concept, and sets up professional and targeted majors such as fire command, fire engineering, aircraft control and information engineering, and rescue command and technology. Although the division of majors is clear and the discipline attributes are standardized, the curriculum of majors is characterized by interdisciplinary, policy and practical, which puts forward high requirements for students' learning ability. It is necessary to further deepen the "student-centered" teaching concept, help students form an integrated vision, break the knowledge barrier, improve strategic thinking, and focus on cultivating students' advanced ability. Through the study situation investigation and teaching analysis, combined with the teaching and research experience, the pain points of "student-centered" teaching in applied colleges and universities are deeply analyzed, and the crux of the problem is dug out in order to realize the ultimate value of moral education.

4.1. Differences in Learning and Application Lead to Poor Practical Results

At present, the curriculum system and personnel training objectives of the college have not fully met the requirements of fire rescue education, and there is a certain disconnect between education output and rescue practice. Taking "Introduction to Emergency Management" as an example, emergency management refers to the government and other public institutions in the process of pre-prevention, response, handling and recovery of emergencies, by establishing necessary response mechanisms, taking a series of necessary measures, and applying science, technology, planning and management and other means to protect public life, health and property safety. Among them, China's fire rescue team is the main force and national team of emergency rescue in China, and bears the important responsibility of preventing and resolving major safety risks and dealing with various disasters and accidents. At present, the course design of introduction to emergency management focuses on teaching theoretical knowledge, and the knowledge, skills and methods required for students' decision-making and commanding in actual combat and field handling are still relatively weak. There is a certain disconnect between education output and rescue practice.

4.2. Low Integration Leads to Poor Teaching and Learning

The teacher's theoretical induction ability and the student's practical ability have not been organically integrated, the mutual promotion effect is not ideal, and the integration degree of teaching-learning is not deep. With the increasing perfection of China's fire rescue system, the continuous improvement of capabilities, and the continuous advancement of the modernization process of fire rescue capabilities, the theories and technologies related to emergency rescue have developed rapidly, laying a solid foundation for the construction of the fire rescue knowledge system of the faculty. At the same time, some students have a certain practical experience, fire rescue practice has a certain degree of cognition, the intersection of the two in the classroom, with a natural advantage of teaching and learning. But at present, the integration of teachers' theoretical ability and students' practical ability is not very high, and there is a practical problem that the teacher-learning relationship is not deep.

4.3. Cognitive Deviation Leads to Insufficient Learning Motivation

In the process of daily teaching, it is found that the students' understanding of the overall orientation of the course leads to the lack of learning drive, which is specifically realized: many students unilaterally believe that the teaching course is a "tall" thing, is the content of senior leadership cadres to learn, as the future grass-roots commanders, "useless", the basic skills of fire rescue will be learned. It is not recognized that the course plays an important role in shaping ideas and ways of thinking, and neglects the cultivation and promotion of strategic thinking. Some students only pay attention to specific knowledge points, but do not realize the integrity of the knowledge system, think that boring, students learn "boring". In summary, some students think that learning is "useless", and some students think that learning is "boring". These two kinds of wrong understanding lead to the lack of learning motivation of some students, learning to stay in the "want me to learn", but did not reach the "I want to learn" realm.

4.4. Lack of Understanding Leads to Lack of Critical Awareness

At present, there is a phenomenon that students do not have a deep understanding of the connotation of learning, which leads to insufficient thinking and innovation consciousness. In the process of learning, students do not understand the internal logical relationship of the university discipline system, only stay in the fragmented mechanical memory of knowledge points, lack the overall understanding of the framework of the discipline knowledge system, and "only see the trees but not the forest". When evaluating the existing practice and social reality in class speeches and assignments, students either think that it is completely correct or completely wrong, and they lack in-depth observation and reflection; Some students with some experience in emergency rescue stay in the existing mode and practice of fixed thinking, acting on experience, and lack of deep rational analysis.

On the whole, a considerable proportion of students lack the spirit of reflection and criticism, breakthrough and innovation.

5. The Transcendence of Practical Difficulties of "Student-Centered" Teaching Reform in Application-Oriented University

In view of the above outstanding problems, we must improve the teaching quality of courses based on the four dimensions of "knowledge", "ability", "research" and "thinking", deepen the cultivation of higher-order ability, and explore the transcendence of the realistic dilemma of "student-centered" teaching reform. Based on the analysis of the causes of pain points, it can be found that the fundamental idea to solve the problem is to enhance the students' "recognition", "closeness" and "practical experience" of the curriculum system, which is realized from the following four perspectives.

5.1. Optimize the Content of the Course and Make it Practical for High Level, Innovation and Challenge

The goal of higher education curriculum system construction is to train high-quality talents, whose quality directly determines the quality of talent training. Although it is a micro problem of education, it solves a strategic problem. How can we achieve curriculum optimization, highlight the characteristic discipline type and practical application-oriented school positioning, adhere to the coordinated development of academic education and on-the-job training, and promote the mutual promotion of teaching and research and rescue tasks? This requires everyone in the college not to be a "bystander", but a "builder", in accordance with the principle of adhering to the classification and construction of undergraduate courses, in accordance with the "high level, innovation and challenge" gold course standards, the implementation of curriculum optimization work.

First, improve the construction of knowledge structure and enhance the higher-order of courses. With the continuous advancement of China's fire rescue cause, the internal demand for theoretical, technical and practical innovation continues to rise, and it is more urgent for theoretical guidance and practice to empower theoretical innovation. This requires that the construction of knowledge system should not only be theoretical and practical, but also strengthen the interdisciplinary depth and knowledge coverage breadth, break the dilemma of knowledge fragmentation, and focus on training students' compound ability and dialectical thinking to solve complex problems.

Second, keep up with the forefront of The Times and highlight the innovation of the curriculum. We should pay full attention to classroom teaching, make comprehensive use of modern technological means, deepen teaching reform around stimulating students' learning interest and potential, promote the construction and application of online courses, promote the deep integration of information technology and education and teaching, and actively develop "Internet + education". Strive to create a group of advanced, innovative and challenging offline, online, online and offline hybrid, virtual simulation and social practice five categories of "golden lessons".

Third, deepen curriculum system design and increase curriculum challenge. Based on the six integrated teaching model innovation of "government - production - teaching - learning - research - application", theoretical innovation and practical innovation are carried out at the same time, deepening the demand driving of fire rescue, enabling the technological innovation achievements of emergency industry, teachers' knowledge imparts, students' ability to enhance, scientific research and innovation for development, and practical application for breakthrough, helping students to view the whole life cycle. The establishment of emergency rescue knowledge system, technical system and ability system, in order to achieve the goal of training application-oriented, innovative high-level emergency rescue personnel.

5.2. Optimize Teaching Methods and Improve Class Quality

Adhere to the problem-oriented, implement the "student-centered" education concept, standardize teaching design from the level of teaching implementation, enrich teaching methods, strictly control classroom quality, strictly grasp teaching evaluation, and maintain the continuous upgrading of curriculum teaching quality.

First, in the integration of online and offline teaching driven by micro-classes and rain classes, students should be guided to integrate fragmented knowledge. The core role of teachers in on-site teaching is to "lead students to organic integration of fragmented knowledge" and form a complete and clear logical relationship of knowledge system. The lecture-type classroom focuses on "static knowledge", while the discussion-type classroom focuses on how to analyze and solve problems by integrating fragmented knowledge points together, so as to solve the problem of "fragmented knowledge points and weak correlation". Through the teaching platform such as rain classroom, teachers are transformed from "single lecturer" to "operation demonstrator", forming a classroom in which "students provide materials and teachers demonstrate and integrate". In the classroom, the teacher should avoid one-way teaching for more than 20 minutes, and either let the students participate in the teaching process and provide materials, or let the students think about problems and build cases, and deeply participate in the teaching process throughout the whole process to eliminate "cold silence" and "distraction". Enhance students' interest in solving problems, and enhance their sense of involvement and participation in class.

Second, strengthen case teaching and enhance practical application ability. By constructing cases with teachers and students, the teaching coupling iteration is realized. Make good use of students with certain grassroots practical experience, personal experience in fire rescue practice and first-hand case data, continue to give full play to the natural advantages of teacher-learning, and carry out a variety of activities such as "students on the platform", case study teaching methods, and desktop simulation of role playing, with teachers acting as "hosts". On the basis of the construction of demonstration cases, students are guided to cooperate in team case construction, and the course content is trained in practical operation by organizing desktop deduction, so as to give full play to the supporting role of the course system for the practical ability of students. Case design and optimization are carried out in both teaching and learning links, so as to encourage students to use knowledge to take the initiative to complete a relatively complex integration process, guide students to think about practical problems in practice, strengthen the analysis of "application scenarios", combine tedious knowledge with specific practical application scenarios to teach, and positively interact with application-oriented knowledge and mastering knowledge. Improve learning initiative and quality.

5.3. Optimize the Evaluation System and Enhance the Motivation of Students

To implement "student-centered" and enhance the endogenous driving force of students' learning, it is necessary to build a comprehensive evaluation system of "multi-subject, multi-content and diverse methods", focusing on improving students' evaluation ability and stimulating their learning drive.

First, starting from the learning results, we should formulate curriculum objectives, compile curriculum standards, design unit teaching, formulate diversified classroom learning outcome evaluation standards, and establish the corresponding relationship between learning outcome evaluation standards and teaching objectives. Taking into account flexibility, balance, personalization and standardization, relying on rain class to complete attendance, speech and objective question assessment to ensure the objective and accurate data, and designing assessment scales for group activities and final papers to ensure consistent standards.

Second, in the main body of evaluation, it consists of students' self-evaluation, students' mutual evaluation and teachers' evaluation. In terms of evaluation and assessment methods, the combination of formative assessment and final assessment, exercise assessment and written assessment, qualitative assessment and quantitative assessment are implemented, and information such as student needs and case sharing is continuously collected to achieve co-construction between teachers and students.

Reflect the process and result, quantitative and qualitative, individual and team, ability and quality "four combination" assessment concept.

5.4. Consolidate the Red Gene and Strengthen the Curriculum Ideology and Politics

In order to practice the fundamental task of "cultivating virtues and cultivating people", according to the reality of the students, the curriculum system of the college focuses on improving the theoretical literacy of the national comprehensive fire rescue talents and the full process and practical skills of "all kinds of disasters and great emergencies", and runs through the curriculum ideology and politics to establish a great emergency rescue view and firm ideals and beliefs. Master the new trends and concepts of the system, mechanism and legal system, the methods and skills of daily emergency management and wartime organization and command, and the ability of emergency support to improve the construction and development of fire rescue, drive students to recognize the importance and urgency of emergency rescue knowledge from the ideological perspective, let students understand "why to learn", and further identify their own responsibilities and mission positioning to enhance the learning drive. Achieve the goal of ideological and political education.

6. Summaries

The higher education in our country is experiencing an all-round transformation from extension development to intension development. The practice case of the "student-centered" teaching paradigm of CCCI shows how application-oriented University integrate the mainstream teaching concepts of the current era to guide the implementation of education transformation. Its performance is in line with the law of teaching development and the professional needs of the national comprehensive fire rescue team, and it is a subject awakening and selection process of "conforming to the law" and "conforming to the purpose". In the process of transformation, the experience, effectiveness, deficiencies and experience reflection not only show the practical details and difficulties faced under the framework of "student-centered" teaching concept, but also a brave exploration of the paradigm from "teaching" to "learning" in application-oriented universities. In the face of the special orientation and educational goal of China Fire and Rescue Institute, the paradigm exploration of its "student-centered" teaching concept has multiple values, which is worth exploring and expecting again.

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