Research on the Innovative Development of Higher Vocational Students Based on Problem Orientation

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Abstract. Innovative student development is the main goal of higher vocational education innovation. In order to achieve innovative development, higher vocational colleges need to be problem-oriented, starting from the real problems of students, and solving the real problems of students, to meet students' needs and expectations for knowledge, ability, and literacy, and cultivate applied technical and skilled talents that are more suitable for social development needs.

Keywords: Problem orientation · Vocational students · Innovative development

1 Introduction

The innovation-development process usually begins with awareness of the existence of a problem or need, and this awareness stimulates research and activities to create a new solution to the problem or need. [1] The problem is to seek what is unknown according to what is known, and what is not thought according to what is thought. [2] The problem is the internal driving force for the innovative development of higher vocational students.

2 The Definition of Higher Vocational Students' Innovative Development

DRunker pointed out that a problem arises when a living person has a goal but does not know how to achieve it. Whenever he cannot get from one situation to another needed situation by simple action, he has to resort to thinking. The task of this thinking is to design an action that will bring it from the current situation to the desired situation.

The innovative development of higher vocational students actually solves the problem of career development of future professionals, and innovates the core competencies of professional talents to meet the needs of sustainable human development and social

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development. It mainly includes two interrelated parts, one part is the acquisition, transformation and application of existing knowledge, and the other part is the research and invention of new ideas, new technologies and new products. The first part is to use new methods and new perspectives to solve existing problems, depending on why and the reasons, not thinking that existing problems should be solved by existing methods, the latter part is the discovery, research, solution and application of new problems. If higher vocational students have the way of thinking about problems, and integrating problems, they will draw inferences from each other and solve problems with originality.

3 The Dilemma of Higher Vocational Students' Innovative Development

Higher vocational students' innovative development has become an important part of higher vocational education. Improving students' innovative awareness, cultivating students' innovative ability, and enhancing students' innovative literacy play an important role in promoting students' comprehensive development. At present, there are still the following dilemmas in the innovation development of higher vocational students.

3.1 Lack of Innovative Awareness

Being good at finding problems is the premise and key to innovation. Ask a few more whys of things, and you may find the problem. Traditional higher vocational education focuses on theoretical indoctrination teaching, and the evaluation method of standardized test papers. Students only need to memorize and imitate, but do not know how to ask, rhetorically, make a detailed inquiry, and question. They lack the ability to find problems, which inhibits students' innovative consciousness to a certain extent. If students can't even find problems, how they can solve the problems, let alone talking about innovation.

Compared with undergraduates, higher vocational students have relatively weak theoretical knowledge, which is mainly caused by study motivation, study habits and will quality. It is particularly important in higher vocational education to cultivate innovative consciousness and cultivate students' ability of independent choice, hands-on operation, independent thinking and innovation.

3.2 The Influence of Habitual Mindset

The so-called fixed mindset refers to the mental state of being in a state of stagnation due to the limitations of the original analysis and problem-solving experience when solving problems. For a long time, individual students will form their own fixed and stereotyped thinking mode. When facing external things or real problems, they will habitually use specific thinking to solve problems, which affects the development of students' innovative ability. As the French biologist Bernard said, the biggest obstacle to people's learning is not what is unknown, but what is known.

If there is no awareness of problems and no questions are raised, the ability to choose independently will naturally be lacking. In the new era of the integration of knowledge, skills, technology, and humanities, the concept of talent training in higher

vocational colleges also presents the intersection and integration of various thinking. Only by breaking through the influence of the habitual mindset and being problem-oriented, can teachers continuously inspire new thinking spaces and cultivate students' innovative spirit and ability. Based on this, students can better exercise their thinking ability, insight ability, learning ability, master the laws of the operation of things, grasp the inner nature of things, understand their own disciplines and be able to extend and expand to adjacent horizontal disciplines, thereby improving their own understanding and the depth and predictability of thinking.

3.3 Neglect of Innovation Potential Development

In some traditional higher vocational education, too much emphasis is placed on skill-based, and students are simply listed as operators of the assembly line, so that students lose themselves, and repeat a certain action and a certain production mode mechanically. Such students lack the awareness of independent thinking, and are at a loss when confronted with specific problems, blindly following the cognition and behavior of people or books without thinking. The cultivation of innovative personality is inseparable from the cultivation of social responsibility. Youth is the period when people's values and world outlook are formed. It is imperative to guide and protect students' curiosity, self-confidence, imagination, and desire for expression, and cultivate independent, enterprising, exploratory, and independent innovative personalities.

Innovative development also includes potential professional ability, that is, its professional knowledge and skills, professional quality, behavior, ability and attitude displayed in different work situations and tasks. Therefore, scientific and effective vocational ability training should be carried out for students, helping students understand their own characteristics and potential advantages, and self-position their own value, so that students' vocational ability can be closer to their own reality and the needs of social development, so as to avoid the occurrence of the unmatched situation in the employment selection process.

3.4 The Disjunction Between Cognition and Practice

The contradiction between cognition and practice will cause students to be out of touch with their knowledge and actions, and they will be confused and lingering in action. In higher vocational colleges, the existing or possible problems among students are manifested as a state of disconnection between knowledge and action, and inconsistency. Undoubtedly, some students are innovative and expect innovative results in the process of learning and practice. But there is a contrast between their innovative consciousness and innovative behavior. On the one hand, they pursue innovation in understanding. On the other hand, they are relatively slow in action, they do not play an active role enough, and lack the courage and ability to devote themselves to practice.

Theoretical knowledge itself comes from life practice and is the result of life situational experience. Therefore, the educational practice of higher vocational colleges must also come from the life of students, so that students can understand the meaning of theoretical knowledge through rich life experience, and achieve the effect of paying attention to students' emotional experience. Traditional higher vocational education is

limited in some conditions in connection with real life, and cannot meet the inherent needs of students in learning, life, employment, and psychology, and the transformation of knowledge into action is limited.

4 Ability Requirements for Higher Vocational Students' Innovative Development

In the past, higher vocational education was mainly to solve the problem of further education, and the social recognition was low. In addition, some higher vocational colleges did not have a clear positioning of themselves, which could not meet the needs of the society for talents and students' own needs for knowledge and skills. Higher vocational education has reached an important juncture for innovation. Therefore, in order to cultivate applied talents with high technical skills, higher vocational education must be problem-oriented and require students to have a certain ability to adapt to the needs of social development.

4.1 Divergent Thinking Ability

The future life is full of uncertainties, such as the emergence of Bitcoin, artificial intelligence, genetic science, etc. In this ever-changing era, new things emerge in an endless stream, and the way of thinking is updated and iterative. How not to be eliminated by the times and to eliminate inner anxiety is what every enterprising college student is worried about. Some students are afraid of change because of anxiety and anxiety and miss opportunities for continued development.

The ability of divergent thinking is particularly important for cultivating students' innovative ability, and is more conducive to the broadness and openness of students' thinking. That is to conduct a comprehensive analysis of a certain problem, find the focused problem, and then explore the conditions and possibilities of the unknown problem from the known problem. Divergent thinking is not affected by the traditional thinking in the past, it can be turned in time, and it can be used flexibly. The rapid development of society has increasingly advocated an open mind, looking at problems from a broader perspective, and enabling a more comprehensive and complete understanding of problems and discovering new possibilities for problems.

For example, the important function of higher vocational education is to shape the individual sound personality of higher vocational students, so that higher vocational students can form a lofty spiritual realm and healthy psychological quality, so as to actively participate in social life. It can combine self, personality and education to think, aiming at the existing or possible existing ideological and behavioral tendencies among college students, pointing out various theories of the extinction of the subject, the theory that man is a machine, the idea of money worship and hedonism, the theory of disorder in the online world, etc. The root of the problem is to explore the basis for forming a sound personality, a moral personality and a positive outlook on life, that is, to complete a new self-shaping, and explore for the educational goal of higher vocational students growing into talents.

4.2 Perspective Conversion Ability

The transformation of innovative perspectives includes horizontal and vertical binary perspectives, and three-dimensional perspectives of history, reality and future to look at problem analysis problems. The design of the problem is to find out the real needs hidden behind the appearance of things, and strive to explore the core of the problem. The horizontal perspective focuses on the multi-faceted and diverse perspectives, reintegrating problems with new methods, opening up thinking space, generating new functions, and further activating and broadening the horizons of observation and thinking. The longitudinal perspective focuses on the perspective of logical association, sorting out and summarizing problems, and conducting thinking activities of analysis, reasoning, and association according to the internal relationship of the problems. The horizontal and vertical dual perspective guides students to combine real life with theoretical knowledge, link the internal elements of the problem system, and transfer the knowledge, abilities and methods they have learned to their future study and work in other disciplines.

The three-dimensional perspective of history, reality and the future is based on the new view of history, focusing on the practical thinking of historical issues and the historical thinking of practical issues, combining past experience with existing problems, and combining existing problems with problems that may arise in the future. Through the ability to convert perspectives, the three-dimensional perspective integrates existing subject knowledge and problems to think, interpret and infer, independently explore and complete the construction of knowledge and meaning, and gradually cultivate learning methods, ways of thinking, ability levels and value orientations.

4.3 Comprehensive Innovation Capability

The development of today's society requires that higher vocational colleges no longer train only tool people with skills, nor just to make a living, but to cultivate people who develop harmoniously and comprehensively. Einstein also pointed out that it is not enough to educate people with professional knowledge. Through professional education, he may become a useful machine, but not a well-rounded human being. It is essential for students to have an understanding of values and a passion for it. He must acquire a discernment of beauty and moral goodness and starkness. Only people who develop comprehensively and harmoniously can create valuable and meaningful products and service experiences that are intuitive and easy to use.

Higher vocational students' innovative development is a huge systematic project, which requires the support and participation of schools and even society, that is, the guidance and normative power of management systems, systems and operation methods, and the overall cooperation of various resources and personnel. Therefore, in the research of higher vocational education teaching, if the analysis and research of theoretical and practical education and teaching cannot be carried out from a macro perspective and a general idea, there may be singleness and one-sided in theoretical teaching. Therefore, to cultivate students' comprehensive innovation ability, it is necessary to implement the concept of knowledge transfer, ability training, and value guidance through a series of teaching construction, operation and management, turning knowledge into thinking, and thinking into action.

With the development and change of society, new problems will continue to emerge. Therefore, students should establish the concept of continuous learning and comprehensive innovation, and integrate ideological and moral quality, professional quality, psychological quality, only in this way can the new thinking keep up with the development of the ever-changing times, and let the new thinking adapt to the changes of the times and society. Facing the future, not only people who need professional training, but also people who solve problems for society and think and solve problems from the height of human beings. Innovation should focus on long-term goals and be pessimistic about immediate interests. The world has never lacked opportunities, let alone a good platform. What it lacks is people who are willing to solve problems and prove themselves for their goals.

Higher vocational students' innovative development should carry out forward-looking exploration in terms of concept, content and method, and establish the concept of comprehensive innovation by using local development, field intersection, horizontal simulation, penetration, reverse search, organization and coordination, and multi-dimensional perspective. This requires a comprehensive analysis as the premise, using the system theory to decompose and recombine the relevant elements of the problem, to obtain a variety of possible overall schemes, and finally choose through evaluation. On the basis of cognition, students can form relatively stable innovation consciousness and innovation quality by constantly selecting, absorbing, internalizing and sublimating.

5 The Path of Higher Vocational Students' Innovative Development

New innovations are built on the process of problem discovery, evaluation, selection and resolution. Problem-oriented is the driving force for innovative talent cultivation.

5.1 Thinking in the Sensitive Problem-Finding

Identifying problems is more important than solving them. Teachers should face the problem directly, guide students to think deeply about the purpose, position, space and time of the problem, challenge existing knowledge and skills, expand thinking space, and find newer and better answers. In addition, it is necessary to guide students to temporarily put aside the current problem, return to the starting point of the problem, analyze the essence of the problem, and then find a new way to innovate. Through unremitting training, students will gradually form their own way of thinking to deal with specific problems in reality.

Being acutely aware of problems is also about being able to catch potential problems, their advantages or disadvantages. Early detection of problems can prevent problems before they occur, prevent small problems from developing into big problems, and prevent many problems from continuing to occur. Innovation and development is the process of constantly discovering and solving problems, as well as the process of constantly solving deep-seated and critical problems. Whether a person can find problems, whether he is good at solving them or not, tests a person's thinking ability, critical ability and insight. The ability to discover problems is also the source of innovation potential.

5.2 Learning Discrimination in Evaluating Problems Scientifically

To evaluate a problem scientifically means to play the evaluation function of the problem. According to the internal standard, external standard, type and method of the problem, the problem is regarded as the standard and scale for evaluating cognition, thinking, theory and method. The first step in solving a problem should be to figure out if there is a problem? If so, what is the problem? It is necessary to distinguish the true and false of the problem, the quality of the problem, the value of the problem, the important problem and the unimportant problem, and the nature and type of the problem.

With the changes of the times and the development of society, the problems often show a diversified trend. The problems that students face and need to solve often involve problems in many fields, which come from complex, diverse and constantly changing real life. The problems faced and need to be solved come from complex, diverse and constantly changing real life. This requires the use of critical thinking, not sticking to a ready-made answer or inertial thinking, but thinking from multiple perspectives and levels, integrating problems in different fields and disciplines, and producing solutions and answers with different ideas and directions.

Questioning, reasoning, analysis, and judgment are easy to collide with the spark of innovative thinking. Whether it is to find problems in intricate relationships, to summarize problems from experience, or to ponder problems and seek solutions to problems, they all cross a single field and need to integrate viewpoints, methods, approaches, and strategies from multiple fields to expand understanding and realm of thinking.

British philosopher of science Popper believes that science should be conceived as a continuous progress from problem to problem. The quality, richness, and depth of new questions a theory generates are the best measures of its inherent scientific significance. [3] Whether a problem is valuable and meaningful not only depends on whether the problem itself is theoretical and interesting, whether it attracts students' interest and enables students to understand it in simple terms, but also depends on whether a problem stimulates new problems, extends to multiple new problems, and triggers new thinking and exploration. Problems promote the renewal of knowledge and concepts, and are an important prerequisite for the formation and development of innovative consciousness. Therefore, according to the new knowledge system, constantly discovering, excavating, introducing and replacing problems is the key to maintaining the vitality of innovation.

5.3 Expanding in the Rational Choice of Problems

Reasonable selection of problems means focusing on core problems, simplifying some functions and features, and highlighting core functions. Grasping the core problem, focusing on the problem and its causes, and digging out the cause of the problem, is conducive to simplifying the complex.

Mike Collins, founder of BIG, believes that successful innovators are always good at using observational skills. Observation is not something that happens in a day. It is in the nature of innovators to observe the world around them all the time and ask many questions at the same time. [4] When the problem comes in reality, it is necessary to discover the non-essential content of the problem and gradually clarify the essence of

the problem. Innovators need to identify which are the core problems and which are non-core problems in the intricate relationship, and then analyze which are related problems through logic and experience, and stimulate new insights from the related problems, clarify the essence of the problem, and discover the essence of the problem is to solve the problem in a targeted manner.

It is also necessary to find core issues in the teaching of higher vocational education, and such core issues play an organizational role in focusing and bearing on the entire classroom teaching. The process of students seeking evidence and answers around core questions is the process of constantly activating innovative thinking. Questions guide students to think independently, and inspire students to integrate existing knowledge, experience, theories, and methods. In addition, students express their views on issues, inspire each other in discussions and debates, and their understanding becomes more clear. Questions unite inside and outside the classroom, allowing innovative thinking to be extended and expanded in continuous interaction. In the whole process, teachers become the guide, inspiration and organizer of the problem, and students become problem solvers, thinkers, and speakers.

5.4 Being Inspired in Efficient Problem Solving

Efficient problem solving is the breakthrough of innovation, and it is to explore innovative methods, means and measures around core problems and key problems. In the process of education and teaching, some classroom innovation models are just to attract attention and pursue fancy and diverse forms. In fact, they cannot solve any problems, and students cannot gain or inspire from them. If innovation cannot solve practical problems, but only for innovation's sake, it cannot be called innovation in the true sense.

Investigation and research is to solve problems, which requires specific analysis of specific problems. Investigating is like having a baby in October, and solving a problem is like giving birth. [5] Efficient problem solving is to play the transformation function of the problem. Teachers need to select information, activate knowledge and coherence around the effective solution of the problem. Without problems, thinking will become obsolete, methods will become dull, truth will age, thinking will stagnate, emotions will generalize, and will take a break. [6] Problem solving is a challenge and test for people's cognitive judgment, spiritual will, emotional attitude, and thinking method, and it is also the driving force for people's continuous innovation and development.

6 Conclusion

The innovative development of higher vocational students begins with the awareness of problems or needs such as the lack of students' innovative awareness and the need to enhance their innovative ability. This awareness inspires people to carry out research and activities, so as to find measures to solve problems or meet needs. The innovative development of problem-oriented higher vocational students requires students to have divergent thinking ability, perspective conversion ability, comprehensive innovation ability to adapt to social development, and these abilities need to be gradually cultivated and

improved in the process of keen discovery of problems, scientific evaluation of problems, reasonable selection of problems, and efficient problem-solving.

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