

On the application of knowledge "internal circulation" strategy in research teaching

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ABSTRACT: The "internal circulation" of knowledge not only follows the development law of constructivism, but also releases the teaching vitality of college teachers and students, but also promotes the cultivation of meta thinking ability. From the perspective of system theory of research teaching, the goal of system function is to educate people; Systematic communication takes "situation" as the means; The system operates through the classroom.

KEY WORDS: Research teaching Knowledge "internal circulation" Social system theory

Date of Submission: 04-10-2021

Date of Acceptance: 18-10-2021

I. INTRODUCTION

Research teaching believes that the construction of knowledge and the acquisition of meaning are no longer centered on teachers, but should give full play to teachers' teaching guidance role, help students create a scientific and appropriate problem-solving environment, give students sufficient "research" space to give full play to their own creativity, imagination and understanding, and realize students' independent exploration and reproduction of knowledge. Modern constructivism not only enlightens us, but also brings new problems. In philosophy, constructivism tries to "construct" everything and regards individualism as an intuitive factor of theoretical construction, but it can not completely abstract reflect on "human existence". The lack of historicity is always the value regret of contemporary constructivism. In teaching practice, from top-level design to grass-roots teaching, the allocation of research teaching resources in Colleges and universities is not satisfactory, and the teaching result oriented curriculum evaluation system still can not meet the needs of teachers and students' creative, open and exploratory teaching practice. These obstacles together constitute the Reform Dilemma of research teaching in Colleges and universities. The traditional view of education holds that the value of the education system is reflected in the continuous knowledge production. Aiming at the development trend of higher education and innovative compound talent training, research teaching will pay more attention to the communication efficiency of knowledge and value. The improvement of knowledge mobility will effectively test the universality of university education truth, and better grasp the rational connotation and boundary of research teaching from the perspective of history and practice. The social system theory (hereinafter referred to as the system theory) gives us the power to re-examine the operation of the research teaching system in Colleges and universities from a systematic perspective. By deeply understanding the system's self production logic and scientifically allocating the relationships and resources of various elements in the system, we can effectively stimulate the vitality in the research teaching.

II. THE "INTERNAL CIRCULATION" OF KNOWLEDGE CONFORMS TO THE REFORM LOGIC OF RESEARCH TEACHING IN COLLEGES AND UNIVERSITIES

2.1 The "internal circulation" of knowledge follows the development law of constructivism

In different fields of Humanities and Social Sciences, Chinese scholars have defined and applied the related concepts of "internal circulation". The "internal circulation" of knowledge proposed in this paper is an abstract metaphor for the dual functions of self production and self reference of the research teaching system. The "internal circulation" of knowledge takes "situation" and "problem" as the medium of "communication" between teachers and students, and produces the "spillover effect" of knowledge by excavating the internal fluidity of knowledge, so as to realize the accelerated transformation and social construction of knowledge, So as to comprehensively promote the system's self production efficiency and environmental adaptability, and achieve the shaping of students' healthy personality and the iterative upgrading of morality and values. The

value of knowledge "internal circulation" is reflected in improving the efficiency of knowledge flow between teachers and students in the system, taking the "problem situation" as an opportunity to promote the occurrence probability of double contingency of knowledge flow, and realize the systematic consensus of knowledge and value transformation. Understanding the complex relationship between various factors in Research-based Teaching from a systematic perspective not only means a deep understanding of the practical urgency of comprehensively improving the comprehensive quality of college teachers and deeply understanding the development needs of college students, but also contains the problem of knowledge flow to accurately grasp the reform of knowledge supply side and release the internal demand of knowledge. The creation of "problem situation" is like building a "highway" to provide efficient flow and transformation of knowledge, accompanied by the high publicity of moral emotion and the transmission and sublimation of spiritual value. The knowledge "internal circulation" network established between teachers and students in Colleges and universities will effectively break the traditional resistance of research teaching reform and radiate the internal vitality and evolutionary potential of university education.

2.2 Knowledge "internal circulation" releases the teaching vitality of college teachers and students

The soul of research teaching is to learn knowledge in "research". The essence of research teaching lies in the innovation of teaching methods. Finally, it should take the teaching effect as the realistic foothold. Some colleges and universities misunderstand the significance of research teaching and misinterpret it as promoting students to carry out scientific research. In fact, it is better to call it "instructional research" or directly "research" than "research teaching". The core of the "internal circulation" of knowledge is to give full play to the subjective initiative of teachers and students, give students a certain free learning space, make knowledge learning "distributed on demand" and fully mobilize students' interest in learning. Dewey believes that linking learning based on "action" with uncertain situations is the root of interest in knowledge exploration. In the research-based teaching system, the inherent uniqueness, enthusiasm and possibility of "situation" endow the abstract professional theory with directness and reality, stimulate students' desire for exploration, and inspire and guide students to move forward to the "unknown" field. The key to the implementation of research-based teaching is to create a problem-oriented realistic situation in which teachers lead students' knowledge and skill learning. Therefore, creating an effective problem situation is the key to building a communication network between teachers and students. Situational construction has become the core element of the research teaching system.

2.3 Knowledge "internal circulation" promotes the cultivation of meta thinking ability

Meta thinking is an important part of meta cognition. Improving the ability of meta thinking by improving teaching methods is the development trend of higher education in the future. Research teaching based on constructivism has naturally become the focus and research object of many colleges and universities in the world. The so-called meta thinking is an individual's planning, monitoring and Reflection on his own thinking activities. It plays a vital role in guiding and coordinating cognitive development. It is an individual's thinking of "self thinking" [10]. According to the difficulty of thinking, meta thinking can be further divided into general meta thinking and situational meta thinking. The former refers to the general "meta thinking habit" or "meta thinking consciousness" mainly existing in various thinking activities such as daily learning and homework, while the latter refers to the use of meta thinking in a specific task situation measured immediately after completing an activity. Specifically, the "internal circulation" of knowledge widens the channels of knowledge transformation, provides the task situation for the use of meta thinking, improves the level of individual cognitive pressure, and improves the level of situational meta thinking of students from the cognitive level. As a characteristic of learning environment, cognitive stress is different from the common concept of "stress" in psychology and "cognitive load". It is a driving force given by the learning environment to promote individual cognitive activities. Cognitive stress can be divided into two categories according to the learning level required by the environment. One is primary cognitive stress, and the other is secondary cognitive stress: the learning environment of the former does not require a high level of programmed cognition; The latter requires individuals to solve new difficulties and learn new skills in new situations. The "internal circulation" of knowledge gives students more secondary cognitive pressure, which can better promote students to make personalized and targeted selective procedures, so as to promote the improvement of meta thinking ability. General meta thinking and situational meta thinking contain these three stages: planning, monitoring and reflection. These three stages all reflect the individual's cognitive process of his own thinking activities. Among them, meta thinking monitoring is not only a psychological process for individuals to adjust their own thinking activities, but also a core component of meta thinking. The "internal circulation" of knowledge constructs the socialized meaning network of unstructured knowledge around the situation, helps teachers and students reproduce the detailed process of knowledge reproduction, and improves the operation efficiency of teachers and students' "nerve hub" - meta thinking monitoring. At the same time, the development of meta thinking

monitoring will reduce the impact of individual cognitive inhibition and further promote the double contingency of "communication" in the research teaching system.

III. SYSTEMATIC PERSPECTIVE OF RESEARCH TEACHING IN COLLEGES AND UNIVERSITIES

3.1 The function of social system aiming at educating people

As a teacher of Luhmann, Parsons' structural functional theory helps system theory absorb many nutrients, so that system theory can surpass creatively on this basis. Parsons' structural function theory holds that social "system" is better than "function", on the contrary, system theory emphasizes that "function" precedes "system", and the system exists more to realize its basic function. Research teaching system naturally has the basic function of explaining its social value. Establishing morality and cultivating people is the due meaning of the teaching reform of Chinese colleges and universities. Compared with the basic educational function of the traditional college teaching system, research teaching highlights the attribute of practical education and emphasizes more on meeting the practical needs of establishing morality and cultivating people by cultivating innovative talents in Colleges and universities in the new era.

3.2 Social system communication by means of "situation"

Constructivist learning theory holds that learners' meaning construction comes more from dialogue in the situation, which coincides with the view that social system theory emphasizes "communication". "Situation" is a special way of "communication" between teachers and students. System theory holds that communication is the basis of self production and self reference of all social systems, and social systems constantly deal with the complexity brought by the environment in communication. The communication purpose of the research teaching system is to keep the smooth and efficient dissemination of knowledge. Knowledge is also constantly refined in the communication, so as to meet the practical needs of teachers and students in the social system. We emphasize that relying on "situation" to establish the circulation network of knowledge transformation is not to deny the significance of value and emotion in research teaching, but to highlight the role of "situation" as a container for the storage of knowledge and value, and help college students better improve their theoretical reserves, cultivate professional skills and improve their self personality through the construction of "situation".

IV. THE BASIC CHARACTERISTICS OF "INTERNAL CIRCULATION" OF KNOWLEDGE

4.1 Based on de knowledge Centrism

Since the middle ages, universities have been playing a central role in the production of social knowledge and maintaining the authority and power of the traditional religious rule of the European holy see. The industrial revolution broke the production relations of feudal landlords, nobles, farmers and handicraftsmen. Capital driven knowledge production in universities paid more attention to the reality of social benefits. Since the information revolution, the diversity and complexity of social system have been raised to an unprecedented level. The large social system has evolved into countless new social systems with symbolic value as the core, and evolved itself in communication all the time. The rapid transformation of social structure and production relations urges universities to urgently change the traditional thinking mode of knowledge production and make it an important part of de knowledge centrism to adapt to the development of modern knowledge economy society.

4.2 Taking the development needs of college students as the core

The realization of efficient knowledge dissemination is inseparable from teachers' keen insight into the practical needs of college students in real life. The complexity of contemporary society makes the development needs of college students full of various possibilities and uncertainties, which together constitute the complexity of the research teaching system. The development needs of college students directly determine the production logic of systematic knowledge mobility. College teachers can realize the social significance of systematic self production only by firmly grasping the needs of students' life practice. In research-based teaching, college students' learning performance and practical results are not only reflected in the constructive understanding of knowledge, but also depend on a clear understanding of their own abilities and needs. Vygotsky's "zone of proximal development" theory explains the basic logic of College Students' knowledge learning at the cognitive level. Education is a social and cultural practice to make up for the difference between students' cognitive level and possible development level. The learning potential and creativity stimulated by the research-based teaching system will guide students to climb the new "nearest Development Zone" step by step in the socialized situation, so as to better improve the contingency probability of cognitive iteration in the next "problem creation".

4.3 Taking the mobility of knowledge and self production as the main line

Shannon, the founder of information theory, defined information as "the uncertain description of the movement state and existence mode of things". The greater the uncertainty of a thing, the greater the amount of information it contains [16]. Knowledge is organized and systematic information. The uncertainty of the things described by information also creates the instability and development of knowledge. With the rapid change and evolution of modern information, we do not have to excessively pursue the universal value of knowledge itself as in the past. The channel network carrying knowledge has more practical significance than information itself in a certain sense. Compared with the traditional teaching system, the self-production of research-based teaching system emphasizes the mobile production of knowledge. Knowledge flow has become the survival magic weapon of system evolution and upgrading. Through the interaction of each subject's knowledge space in the system, the extensive flow of knowledge will gradually form a new knowledge network. Today's society is an era of "flow is king". Only through the continuous innovation of teaching means and science and technology and the continuous optimization of the "communication" channel of the system, can teachers' stock knowledge be transformed into tradable flow knowledge.

V. THE REALIZATION FORM OF "INTERNAL CIRCULATION" OF KNOWLEDGE

5.1 Strengthen the allocation of research teaching resources and improve the productivity of the system

Research teaching resource sharing is the material basis of system self production and the core index to measure system efficiency and quality. The construction of research teaching resources should be improved from three aspects: digitization, service and interaction. Firstly, give priority to the development of the digital attribute of research teaching resources and increase the construction and investment of digital research teaching resources. Modern higher education is increasingly showing the development characteristics of openness, inclusiveness and sharing. The construction of digital research teaching resources is the inevitable trend of upgrading the means of production of research teaching system. Through extensive cooperation and exchanges between universities, scientific research institutes and enterprises, establish a cooperative network team of "interdisciplinary, interdisciplinary, interdisciplinary, inter school and inter school enterprise", continuously improve the quality of digital research teaching resources, reduce the production of inefficient and repetitive courses and learning resources, and optimize the transformation path of knowledge, so as to promote the knowledge mobility and production efficiency of the system. Secondly, it focuses on the service attribute of research teaching resources. Provide students with "private customized" learning materials as much as possible to meet students' diversified and personalized knowledge and value needs, reduce the process of knowledge transformation in the system, and improve the comprehensibility and transmissibility of knowledge units. It is an important means to improve learners' learning efficiency by labeling the preparatory knowledge and target knowledge of learning objects, constructing domain knowledge network, and finally recommending adaptive learning paths for college students' personal needs [17]. Finally, strengthen the interactive attribute of research teaching resources.

5.2 Reshape teachers' and students' classroom teaching ideas and liberate the tension of knowledge flow

Making knowledge flow is an important development proposition of the research teaching system. The formation of knowledge flow network is a powerful proof of the self production ability of the research teaching system. In the research teaching system, knowledge flow mainly shows the circulation and interaction of teachers' and students' knowledge according to the problem needs in the "situation". The core factor to promote the development of the system is the "expectation" psychology of each subject in the system. In the research teaching system, teachers' teaching enthusiasm and students' learning motivation are the main components of "expectation". These "expectations" run through the actions of all subjects in the system. It is expected to expand the psychological world of teachers and students, together with their research teaching practice, to a diversified complex structure, forming a nonlinear and non unidirectional complex system. Every system that can produce itself must contain interrelated components. The interrelationship and renewal of components constitute the basis of system self evolution. The survival of the system not only depends on the realization of its self production capacity, but also ensures that the "component" itself can continue to produce itself in the system. Teachers and students are important "components" of the research teaching system. Teachers and students drive the self evolution of "components" through self-awareness upgrading and concept innovation, so as to promote the qualitative leap of knowledge flow efficiency of the whole system

VI. CONCLUSION

Research-based teaching is a developing and overall socialization process of constantly updating self-awareness and values. Deepening the reform of teacher evaluation system will improve the sustainable self production of research teaching system from the following three aspects: first, accelerate the reform of

evaluation means and stimulate the creative potential of teachers and students. The active use of new technologies and new means can capture the social ductility of research teaching practice, so as to broaden the channels of innovation and creation between teachers and students in Colleges and universities. Making rational use of the decentralized and distrustful characteristics of blockchain technology, the distributed research teaching record blockchain developed based on it adopts the technical structure of recording data in chronological order, which can be used as the evaluation basis to measure the quality of "situational" dialogue of the system. Using the emotion mining function of artificial intelligence natural language processing technology, we can judge the positive and negative emotion level in students' subjective teaching evaluation messages, which can be used as a reference for the evaluation of teachers' research teaching achievements. Secondly, accelerate the reform of evaluation content and improve the level of teaching efficacy. By breaking the single teacher evaluation mode of "paper only" and "subject only", the personalized and diversified research teaching methods and the latest research results are timely and effectively incorporated into the teacher evaluation system, so as to promote the generation of College Teachers' constructivist beliefs, slow down the occurrence of teachers' job burnout, and finally improve teachers' subjective teaching efficacy. Finally, accelerate the reform of the evaluation process and improve the in-depth learning level of college students. Establishing a scientific evaluation system in the fields of situational design, teacher-student interaction, classroom atmosphere and interest cultivation of research teaching, focusing on the quality of daily teaching communication and interaction between teachers and students, and timely feedback is the basic premise of comprehensively and objectively examining students' learning effect. Through the multi-dimensional, three-dimensional and comprehensive evaluation model, taking promoting the life development process of college students as the starting point and destination of evaluation, the "student-oriented" learning evaluation is implemented in the two dimensions of "depth" and "thickness" of College Students' learning, so as to ensure the stability of self-production of research-based teaching system.

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Hao Tao. "On the application of knowledge "internal circulation" strategy in research teaching."
IOSR Journal of Humanities and Social Science (IOSR-JHSS), 26(10), 2021, pp. 46-50.