

On “Credit Bank” Mechanism in Modern Vocational Education System

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Abstract: The advent of knowledge-based society makes higher education accessible to the public to meet their requirements for equal opportunities and diversity. “Credit bank” mechanism can be adopted to link vocation and education, vocational training and school teaching, higher education and education of other forms and thus enable students to face up to vocational challenges and keep pace with the industry. With course selection as its core, “credit bank” mechanism uses the functions and characteristics of banks for reference to realize functions like credit storage, exchange, loan and converting and makes it possible for students to choose freely learning content, paces, locations and methods and finish studies anytime and anywhere. The innovation of development credit and integrated grade point, conversion of limited storage quota to unlimited one and implementation of elastic credit system provide students with chances of getting high grade points in obligatory courses and development credits, allowing some to be ordinary while stimulating others to be excellent, and thus achieving variable cultivation. However, the implementation of “credit bank” mechanism requires large-scale reforms of traditional education model to motivate teachers’ enthusiasm, stimulate students’ initiatives, solve management problems, overcome resource limitations and win the credibility test.

Introduction

“Credit bank”, with autonomous course selection as its core, is one of the forms of credit system. By using the function and characteristics of banks for reference, it measures the results of students’ studies by means of credit storage, grade point calculation, etc. Compared with traditional learning system, it is more flexible, diverse, accessible and efficient to exploit students’ potential and initiatives, thus increasing the effectiveness and efficiency of learning activities. “Credit bank” mechanism was introduced into China in the middle of 1990s after its long-term overseas development experience. Since then, it has been strongly advocated in vocational education and permanent education. Moreover, proposals were put forward to establish the assessment system of learning outcomes and “credit bank” mechanism in the recently published *National Medium and Long-term Educational Reforms and Development Planning Outline (2010~2020)*[1]. In addition, credit accumulation and transfer scheme (CATS) was brought forth to promote the mutual recognition of learning outcomes in *Decision of Accelerating the Development of Modern Vocational Education* by State Council. Thus the unique functions of grade points are of great significance in vocational education. This work put forward some possible function choices for “credit bank” mechanism, based on the investigation into its implementation background. It also analyzed the existing problems and challenges.

Background Analysis of “Credit Bank” Mechanism

The emergence and development of “credit bank” mechanism resulted from the development of higher education instead of accidental factors. Nowadays, it is getting more and more difficult to distinguish higher education from vocational education. Besides, modern vocational education system, characterized by the function of connection, comes into being. As a kind of social

organization, “Universities differ in different countries...the Paris of 1900 has little in common with the Paris of 1700; the Oxford of the twentieth century, externally so largely the same, is nevertheless a very different thing from the Oxford of the eighteenth century” [2]. “The uniqueness of the university, that peculiarly invention whose meaning and purpose have changed from age to age and from society to society from its birth in twelfth-century Italy and France to its colonization of the whole modern non-European world, lies in its protean capacity to change its shape and function to suit its temporal and sociopolitical environment while retaining enough continuity to deserve its unchanging name.”[3] With its changing forms, university always tries to be useful and makes contribution to its own development. As a worldwide strong power of higher education, the US invented a set of flexible credit systems for its unique higher education. Credit circulates as currency in them[4]. Korean Educational Development Institute (KEDI) also put forward “credit bank” mechanism officially in 1995; lifelong learning account system was promoted across the UK in 2000; European Higher Education Area was established in 2010. With the mutual recognition system of credits, students can study in different schools across the area without affecting their studies. In recent years, pilot “credit bank” mechanism was also launched in China to explore open establishment mode of university. It aims to establish complete system of learning outcomes authentication and “credit bank”. It is historically inevitable to implement “credit bank” mechanism, because it has already been widely accepted in many countries.

Requirement of Equal Opportunities for Higher Education

Three points were listed to promote equal opportunities for higher education in *World Declaration on Higher Education for the Twenty-First Century* (WDHE21STC) by United Nations Educational, Scientific and Cultural Organization (UNESCO)[5]. When higher education entered popular stage in China, colleges and universities were also expanding enrollment in many other countries, especially in North America, Europe and Oceania. After the enrollment expansion, the gross enrollment rate (from 9.8% in 1999 to 24.2% in 2009) rose merely by 10 in the worldwide rankings[6]. In the request of the times, higher education has become accessible to the public though it is exclusive to the minority before. The popularization of higher education means tolerant entry and strict exit of colleges and universities. However, strict exit does not mean limited exit. Therefore, necessary conditions should be created for students of different personalities or levels to leave for society[7]. It is essential for colleges and universities to interact with educators and educates, open mind and exploit resources to arouse social members' desire for learning and offer access to lifelong learning and diploma to those who are capable of learning and long to realize their dreams. “Credit bank” mechanism is to education what bank is to economic activities.

Functions of Higher Education in “Knowledge-based Society”

The WDHE21stC points out that it is essential to offer students necessary and strong education or training according to their needs in the knowledge-based society of 21st century[5]. With the advent of knowledge-driven economy, the intellectual labor has become the major form in labor market, and the application-oriented higher education, an important mode in the field. Application-oriented higher education is characterized by students equipped with necessary skills to complete practical and specific works and potential social abilities. It includes vocational education and general higher education, in which with professional abilities and vocational education mutually recognized, students would be appraised by authoritative vocational qualification appraisal department and tested by vocational posts. In response to vocational and industrial demand, higher education needs to get rid of ivory tower model. Nowadays, employing units are more and more willing to establish cooperation relations with colleges and universities in China. Below listed are some data from MyCOS Co., Ltd. There were various cooperation modes expected by employing units in 2011. 74 % of them offer internship in their own organizations; 50% take part in the teaching reforms of schools; 36% set up practical training base at schools; 28% supply schools with order form training[8]. It is not uncommon for some vocationally experienced people to receive higher education. In the meantime, some college

and university graduates also participate in vocational training and receive vocational qualification appraisal. “Credit bank” mechanism could be adopted to effectively link vocation and education, vocational training and school teaching as well as higher education and education of other forms.

Diversified Requirements from Higher Education

WDHE21stC emphasizes that equal opportunities should be diversified to provide students with various chances to acquire knowledge and skills in a lifetime. In the request of variable cultivation, the entry and exit should be flexible in higher education. First, higher education should be human-oriented and respectful of individuality. Every student has his/her individual talents, as every living being has its own ecological niche. Therefore, some students should be supported to develop their strengths against the prejudice from examination-oriented education, thus guiding their self-development. Secondly, higher education should lower its threshold to realize variable cultivation. Considering the difference of levels, basic requirements should be lowered so as to leave sufficient progress space for all students, making it possible for latecomers to catch up and pioneers to go further. Besides, various choices can be offered to students, such as technical skills, academic development, comprehensive development and research and innovation. Learners are chosen from them, and then make achievements in corresponding field. Moreover, there should be a balance between breadth and depth. Thirdly, students' strengths should be developed and weaknesses avoided. As the most important but limited resources, students' energies should be utilized to develop their strong points to maximize the benefits. Every individual certainly has weaknesses, if he/she has strengths. Top students should be provided with favorable conditions to work freely and realize self-transcendence, ordinary ones guided and cultivated diversely so as to make achievements in a certain field, and academically troubled students assisted in accomplishing their basic goals[9].

Course selection system is the core and soul of “credit bank”, which allows students to freely choose their majors, courses, teachers, lecturing time, learning method and quantities of subject according to their interests, abilities and strengths. That is to say, students are entitled chances of designing their careers by adjusting their choices and pursuing personal goals by motivating their initiatives.

Operative Functions of “Credit Bank” Mechanism

“Credit bank”, as one of the forms of credit system, uses the functions and characteristics of banks for reference to realize functions like credit storage, exchange, loan and converting and makes it possible for students to choose freely learning content, paces, locations and methods and finish studies anytime and anywhere.

Credit Storage

Credit storage gives possibilities of the diversity in credits' sources and the flexibility in time and location. Valid results are mutually recognized in different schools or educational institutions; credits can be obtained from courses beyond teaching plans or a second major; students can get credits by their success in national authoritative exams or appraisals; what count also are the achievements in social or professional practice; the results matter if students' invention or thesis is awarded in relevant disciplines, science, technology, arts, sports, practice, etc.

On the basis of the researches and practices of the author and others, development credit system has been implemented in Jiangsu Teachers University of Technology with limited storage quota converted to unlimited one. In the context of the current education management, it is rather difficult to carry out flexible schooling scheme in China and in particular for students to graduate in advance. Through flexible credit system, students, however, are encouraged to accumulate more credits within finite time. Teaching planning provides all students with a threshold rather than limit. When allowed to be ordinary, students are also motivated to be exceptional in the context of popularized higher education. Apart from the aforementioned sources, credits can also be obtained from the following

newly-developed modules, including discipline development, technical skills, education, minor program and, technological innovation, etc. Thus students can receive systematical guidance and training from any one of them.

Credit Exchange

Credit exchange encourages students to choose some learning contents according to their own strengths, and devote themselves to it by suitable method. Thus education becomes an open system. There are four types of credit exchange listed as follows. The first one is institutional exchange. Different cultivation programs are designed for different students. Moreover, measures are taken to grade curricula so as to satisfy the individual demands of students. For instance, the following courses are classified into different levels, including foreign languages, basic courses, professional skills, etc. In that case, students with different education backgrounds are able to develop their strengths, avoid their weaknesses, and thus make achievements in their fields. The second is homogeneous exchange. Students are exempt from some courses or tests, if succeeding in relevant authoritative exams or appraisals. Besides, self-learners also can be credited, if succeeding in exams organized by state or other qualified groups. In addition, the learning outcomes are mutually recognized in both theoretical and practical courses, as long as they are obtained at schools of the same level. They could be secondary vocational schools or tertiary ones. The third is individual exchange. The credit exchange follows the principles of homogeneity, if any academically troubled students want to change their majors. That is to say, credits should be exchanged within equivalent courses. The final one is compensative exchange. With credits of superior quality or quantity, an imperfect student can compensate for his or her own weaknesses. For example, their innovation credits can be converted into courses credits within teaching plans, if students win any competitions of invention and creation or professional disciplines. Development credits convert into credits of compulsory courses at the ratio of 3:1 in Jiangsu Teachers University of Technology. The purpose of this regulation is to create favorable conditions for extraordinary talents to develop their strengths and avoid their weaknesses.

Credit Loan

Credit loan is a sort of flexible credit management mode on condition of credit guarantee. With this program, a broader independent space is left with dynamic and capable students to coordinate the time, pace and method of learning. Thus they can exploit their talents to the fullest. Firstly, students are allowed to take exams without attending the corresponding classes, if they get high marks in last semester. In other words, these ones can take examinations of relevant courses through outside-class learning, except for PE and practical ones. They can obtain credits, as long as they reach good grades. Secondly, any examinees of graduate student entrance examinations can apply for exemption from the exams of related courses. The results can replace courses exams, if they succeed in any subjects or all of graduate student entrance examinations. Thirdly, students are exempt from some subjects, if they take part in research, engineering practice, practice and internship, school exchange or job training, etc. The achievements are acknowledged to be credits. Finally, bachelor degrees can be awarded within three years on the following conditions, if students don't get them due to academic failures at school. They return and make efforts to obtain the required grade points; they achieve any breakthroughs in practice that are recognized to be credits.

Credit Converting

Credit converting system is used to evaluate students' studies by grade point average and weighted grade point in a separate or complete phase. As the indicator of quantity, credit determines whether students complete the whole learning process; similarly, as the water mark of quality, grade point measures their learning outcomes. Credit converting of integrated grade point was innovated in Jiangsu Teachers University of Technology by the development credit system. On the conditions (integrated grade point = grade point average* (earned credits / required credits)), the balance is located between the quantity and quality of learning. Moreover, students have opportunities for

getting high grade points in compulsory subjects and credits in developments programs. Thus, it is to their advantage, whichever they choose between professional development and comprehensive development.

All in all, “credit bank” mechanism is a complete system, in which “clients” should be managed differently, with dynamic and credible students with a maximal progress spaced by credit exchange and loans, dynamic students without planning in making choices assisted by offering developments modules with tutors and un-dynamic students without goals supervised and reminded to pay attention to the bottom line by the three-guide system and early warning system. Thus profits increase, and losses decrease in studies.

Solutions to the Problems in “Credit Bank” Mechanism

“Credit bank” mechanism involves a great variety of reforms and completions in many systems, including enrollment, conversion, credit, course, schooling, course selection and evaluation, etc. The new system can overcome the enormous challenges on condition of a large-scale reform on traditional education model.

Motivating Teachers' Enthusiasm

In the context of long-term traditional education model and management system, some teachers, to a large extent, are stereotyped. Therefore, it is rather hard for them to adapt themselves to the new model. Influenced by cult of discipline, some teachers are reluctant to update their teaching contents flexibly and dynamically in terms of educational ideas and adopt students-centered teaching in terms of role orientation. Thus they are not adequately motivated and prepared to improve their teaching methods and treat students as peers; as for the teaching abilities, some teachers are hardly able to satisfy students' requirements for effectiveness and practicability. Moreover, they are unable to be the mentor of students with limited knowledge out of practice and simple methodology. From the perspective of work attitude, some teachers tend to spend more time in scientific researches, processes and complaints than in teaching, results and dedication. As put by Burton R. Clark, “Innovations ‘fail’” because the innovators cannot acquire enough power to protect their new ways. They are allowed to start but unless they attach the interests of various groups of their own, persuading potential opponents at least to be moderate in their opposition, they can be tightly bounded”. [10]. Here, teachers are the very interior. As a result, it is no wonder that some teachers react negatively to or even resist the reforms. To say the least, they are the biggest drag force of “credit bank” mechanism. With the popularization of this system, it is very urgent to strengthen teacher's morality, improve their teaching, complete the evaluation standards, and establish the flow mechanism of them. As an effective form, tutorial system stimulates exceptional teachers to serve students and promote teaching reforms. Tutors help students get rid of the learning methods of secondary school. By introducing them to the professional field, students' learning abilities are cultivated. Moreover, troubled students are assisted with problems in majors and methodology based on their academic conditions, course selection and learning outcomes. In the meantime, tutorial system also attracts exceptional students to laboratory or team of teachers, thus engaging in high-level scientific researches. Therefore, students are offered favorable conditions to cultivate professional skills, and broaden disciplinary knowledge and explore other specialties.

Stimulating Students' Initiatives

Some students are unable to adapt themselves to the new mechanism in the context of examination-oriented education and passive learning. They easily get lost in various choices by ignoring the essentials due to their narrow horizon and lack of social and industrial knowledge. Moreover, these students may not know about the necessary systematical regulations, not to mention the scientific application of them. For one thing, they are not motivated sufficiently to devote their initiatives to learning; for another, they don't even care the course modules design and professional objective. For the insufficiency of learning abilities and self-discipline, some of them cannot complete

the specified objectives, resulting in academic crisis. Therefore, “credit bank” mechanism should be designed based on the practical situations of education in China. It operates autonomously under the guidance and supervision of authorities. Tutorial system aims to solve methodological problems; Early warning system sets out to deal with attitudinal problems. Besides, it guarantees the implementation of “credit bank” mechanism. It is not effective to simply rely on credit converting or exchange if the related students are insufficiently motivated or of bad learning habits. In contrast, it is necessary to monitor or interfere in their learning process. It is academic warning system that realizes these functions. This system includes academic censorship, early warning information archives, sorted tutoring, individual education, guidance and support, academic warning conversation and notification, contact system with students' guardians, treatment of school roll motion, etc.

Solving Management Problems

“Credit bank” mechanism brings about a severe challenge to management personnel. In order to operate this system effectively and accurately, they should be equipped with open mind, human-oriented conception, cautious attitude and scientific managerial methods. Quantitative management turns to variable management in “credit bank” mechanism. The former is based on class in combination with department management; in contrast, the latter is based on individuals. Therefore, the quantity of students corresponds with the students' information management files and course selection modes at school. Various aspects are changed, including scoring methods, standards and procedures of credits recognition, commitment system and appraisal approaches, the quality-quantity relations of learning, approval of grade points and academic assessment. Concerning teachers' management, it is necessary to establish the new mechanisms of supervision, assessment, evaluation, promotion, punishment, and employment.

Overcoming Resource Limitations

Nowadays, the limited and relatively constant educational resources are hardly enough to meet the infinite and uncertain demand. Thus, efforts should be made to improve the use efficiency of educational resources with the advantage of “credit bank” mechanism. For instance, educational resources can be saved by mutual recognition of credits among different schools or educational institutions. There is no need for repeat courses and exams among them so as to save time. Credits recognition induces industry, enterprises and other social powers to participate in educational cause. It also motivates self-learners' initiatives. In that case, there would be abundant educational resources in China. Influenced by “credit bank” mechanism, some backward educational institutions are either to be updated or eliminated due to their inferior quality and efficiency.

Winning Credibility Test

Since market mechanism is introduced into “credit bank” mechanism, legal system is definitely needed to guarantee the fairness, justice, authenticity and credibility. Besides, an effective supervision mechanism should be established to prevent educators from violating educatees' rights and interests against the nature of education and to guarantee the authenticity of credits. Tuition should be mainly used for educational activities, so as to protect the legitimate rights and interests of educators and educatees. In the meantime, educatees' credibility should be regarded as the essential element; strict mechanism of monitoring, auditing and punishment should be applied to students' identification, scores calculation, learning experience recognition, credentials acquisition and quality of results. Moreover, it is necessary to implement the system of credit archives and signature commitment. The treasury is to bank what the credit is to “credit bank”. Thus it is very important for “credit bank” to preserve the authenticity of credits.

As a new system design, “credit bank” is still in the process of exploration in China. Despite its present challenges, this system is bound to blossom in China with the deepening reforms in higher education.

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