Research on Integrated Education Mode Based on Credit Bank in Secondary and Higher Vocational Education

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Abstract

The development of modern economy produces the constant renewal and progress of the times. Now the state pays close attention to all walks of life in society. Under the background of modern economy, the demand for professionals and comprehensive talents becomes increasingly prominent. Therefore, education development and reform brooks no delay to meet the needs of economic development in modern society. In this context, the state has carried out in-depth education and teaching reform for the cultivation of professionals at secondary vocational schools and higher vocational colleges. In this process, the reform and development of the integrated education mode in secondary and higher vocational education are realized through the credit bank system. Based on this, this paper discusses the connotations of credit bank system and integrated teaching in secondary and higher vocational education, explores the integrated link-up education mode based on transformation tendency model and provides approaches for promotion accordingly. The author hopes that, through the credit bank system, the teaching mode of secondary and higher vocational education can develop more comprehensively.

Keywords: Credit Bank, Secondary and Higher Vocational Education Integration, Education Mode.

1. INTRODUCTION

1.1 Literature review

With the continuing development of education and the enhancement of soft power of national economy, social development demands for more comprehensively qualified professionals. In this context, the talents cultivation mechanism of secondary and higher vocational schools and colleges has become the key point and long-term goal of modern education reform. In this regard, many scholars have carried out special studies. For example, Dai Yae regards that the long-term goal of education and teaching reform at vocational schools and colleges is to implement the teaching mode of work-integrated learning or part work and part study, which can be effectively achieved through the credit bank. The premise to implement credit bank is an effective credit system. At the same time, it is a must to speed up the construction of training bases and curriculum, establish an effective operation and management mechanism of credit bank, and enhance the two-tier (colleges and departments) teaching management level (Dai, 2007). Zheng Chunhua and Gao Zhuangfeng point out that vocational education, as an important part of modern national education system, is of special importance in the implementation of “rejuvenating China through science and education” strategy and “reinvigorating China through human resource development” strategy. In this context, the implementation of the integrated teaching mode of secondary and higher vocational education enjoys a unique advantage in the cultivation mode of vocational education. The credit bank system has become an effective way to achieve the compact and reasonable integration of secondary and higher vocational education (Zheng and Gao, 2013). Qiu Shunv believes that the credit bank system is a bridge to construct the integrated system of secondary and higher vocational education, as well as an instrumental system innovation to optimize the efficiency of secondary and higher vocational education integration. Qiu explores the systematic, institutional, and operational problems as well as curriculum construction in credit bank construction, and puts out a construction strategy based on credit bank system for secondary and higher vocational education integration, including the idea of lifelong learning, reform of education management rules and system, improvement of cross-crediting and credit transfer mechanism, and enhancement of modular curriculum design (Qiu, 2014). Zhao Jing believes that credit bank system is the main mode of operation for lifelong education system and he puts forward three points to improve the integrated mode of secondary and higher vocational education. The first is to analyze the feasibility of the opening of educational institutions and the construction of credit bank. The second is to make a systematic analysis of the approaches for construction. Finally, as to the transition to national open universities, Zhao proposes three forms of realization for the credit bank system.
construction of national open universities (Zhao, 2013). Kang Naimei and Ye Bifeng believe that credit bank system is an effective way to construct learning society and the orientation of remote education reform and development. Therefore, in the construction of remote education credit bank system, it is necessary to recognize the connotation and characteristics of credit bank, face up to and solve deep-seated problems like selective system, education resources, cross-crediting mode and transformation system and management technologies (Kang and Ye, 2009).

1.2 Research purpose

With the rapid progress of modern society and development of economy, the industrial structures of various industries in modern society develop gradually towards intelligence and scientific rationalization. With the fast development of social economy, all walks of life demand more urgently for high-level and comprehensive talents. In this context, the emergence of integrated education and teaching mode of secondary and higher vocational education is consistent with the development trend of market, education and society (Wang and Gu, 2017). Integrated vocational education, as an effective measure to enhance the country’s overall education level, improve labor force qualities, strengthen the technical content of labor and improve people's livelihood, learning effectively from credit bank, can stimulate students’ enthusiasm for learning to the greatest extent and further improve their learning efficiency and teachers' teaching quality on the base of more freedom for students to choose learning time and places. There is a Chinese saying that “it is better to teach a man how to fish than to give him a fish”. The integrated teaching mode of secondary and higher vocational education has transformed traditional teacher-centered teaching to students’ voluntary learning, under which student's learning outcomes and applicability will be significantly enhanced.

2. RESEARCH ON THE CONNOTATIONS OF CREDIT BANK SYSTEM AND INTEGRATED VOCATIONAL EDUCATION MODE

Credit bank system, a learning and education management mode derived from banks’ functions and characteristics, has now been widely used in the education and learning at many universities, under which students can freely choose their learning contents, time and places (Huang and Wu, 2011). Credit bank system is different from the mainstream education modes of academic year system and credit system and its main contents are credit accumulation and the combination of professional skills learning with diploma acquisition. By comparison, the credit bank system enjoys more freedom and learning flexibility (Cui and Du, 2012). The above also shows that the credit bank system is a disruptive evaluation mechanism for learning outcomes, which breaks through constraints from majors and time in traditional education. On the basis of full consideration for the probability and characteristics of the bank business development, the credit bank system innovates the traditional education mode of credit system, making students more desirous and motivated to learn professional skills. Specifically, credit bank system acts like the “savings” management in banking system, under which every student can get corresponding credits as long as he completes a professional course which can be skills learning, textual research as well as compulsory courses for credits accumulation (Wang, 2012). At the same time, credit bank also gives students great mobility in learning. Students can conduct their school works beyond the required academic terms, while like banks’ “installment savings”, students can learn in concentrated time or in fragmentary time. All the school works done in the fragmentary time can be transferred into credits and deposited in credit bank. Such a system can not only enhance students’ interest in learning, but also makes the learning of professional skills much more flexible.

Integrated vocational education is a product of social development under modern economic situation. Complying with the structural adjustment of various industries, it emerges and develops under the background of economic transformation, based on the demand for professionals by all walks of life. The social demand for high-level and high-quality talents promotes the internal structural transformation of vocational education to a more scientific and reasonable direction (Yu and Zhuang, 2015). The development of integrated vocational education and cultivation mode is not only the continuation of modern higher education, but also the accumulation and reserve of comprehensive qualities of social professionals. In the process of integrated vocational education, all kinds of students can not only learn professional skills according to their wills, but also promote their learning concepts. With the cultivation of skilled and applicable professionals as its ultimate goal, integrated vocational education system is concerned with students’ personal characteristics in teaching, brings “no distinction in teaching” and students’ personalized development into realization, and further enhances students’ comprehensive qualities. A perfect integrated vocational education system should satisfy the transformative and upgrading demand of modern society; therefore, the credit bank system implemented in integrated vocational education should also have strong timeliness, flexibility and applicability. This kind of integrated education can connect secondary and higher
Panel vocational education in a more scientific and reasonable way, as shown in Figure 1, realizes the teaching purpose of integrated vocational education, complies with and accommodates the urgent needs from socialist market economy system for diversified, multi-level, multi-specification and highly skilled comprehensive talents to the maximum extent.

Figure 1. Integration Mode of Vocational Education Based on Credit Bank

3. RESEARCH ON INTEGRATED VOCATIONAL EDUCATION MODE BASED ON TRANSFORMATION TENDENCY MODEL

The most important factor in the effective conduction of integrated vocational education is the seamless connection between secondary vocational education and higher vocational education. Generally speaking, secondary vocational education and higher vocational education in most times are overlapped. Therefore, under the principle of fairness and reciprocity, in order to maintain generality, this paper takes ArcGrid raster data as the basis for measurement, obtaining the general matrix for natural transition and the symmetric matrix of integrated link-up of secondary and higher vocational education, the basic form of expression of which can both be illustrated by the relation matrix shown in Table 1.

Table 1 Basic Forms of Transfer Matrix and Adjacency Matrix

<table>
<thead>
<tr>
<th>Secondary</th>
<th>Higher1</th>
<th>Higher2</th>
<th>Higher3</th>
<th>...</th>
<th>Higher n</th>
</tr>
</thead>
<tbody>
<tr>
<td>Secondary1</td>
<td>$X_{11}$</td>
<td>$X_{12}$</td>
<td>$X_{13}$</td>
<td>...</td>
<td>$X_{1n}$</td>
</tr>
<tr>
<td>Secondary2</td>
<td>$X_{21}$</td>
<td>$X_{22}$</td>
<td>$X_{23}$</td>
<td>...</td>
<td>$X_{2n}$</td>
</tr>
<tr>
<td>Secondary3</td>
<td>$X_{31}$</td>
<td>$X_{32}$</td>
<td>$X_{33}$</td>
<td>...</td>
<td>$X_{3n}$</td>
</tr>
<tr>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>Secondaryn</td>
<td>$X_{n1}$</td>
<td>$X_{n2}$</td>
<td>$X_{n3}$</td>
<td>...</td>
<td>$X_{nn}$</td>
</tr>
</tbody>
</table>

When Table 1 represents the adjacency matrix, element $X_{ij}$ indicates the number of nodes for connection between secondary vocational schools and higher vocational colleges, which is illustrated by the number of raster units. According to their differences, adjacent rules can be divided into two forms, namely the neighborhood rules and the eight neighbor rules. Through calculation according to those two adjacent rules, the raster numbers are 4 and 8 respectively.

When Table 1 represents transition matrix, the row lists demonstrate the natural transition from secondary vocational schools to higher vocational colleges, while the longitudinal lists represent the integrated education mechanism. Element $X_{ij}$ illustrates the students’ entrance willingness. Then the natural transition from secondary vocational schools to higher vocational colleges and the integrated education of them can be expressed as:

$$X_{i-} = \sum_{i=1, j \neq 1}^{n} X_{ij}, X_{+j} = \sum_{i=1, j \neq j}^{n} X_{ij}$$

(1)

Therefore, a transformation tendency model can be constructed through the matrixes above. After the summation normalization processing of the basic form of the above matrixes, transition probability matrix and adjacency probability matrix can be obtained as:
\[ P_{ij} = \frac{X_{ij}}{\sum_{j=1}^{n} X_{ij}} \] (2)

\( s_{ij} \) represents the transformation probability from secondary vocational schools \( i \) to higher vocational colleges \( j \). The transformation probability matrix of integrated vocational education can be expressed as: \( S = (s_{ij}) \). Similarly, \( n_{ij} \) represents the adjacency probability from secondary vocational schools \( i \) to higher vocational colleges \( j \). The adjacency probability matrix can be expressed as: \( N = (n_{ij}) \).

On this basis, with the help of fairness effect, when there is conflict between natural transition and integrated education transformation, students’ choices will be the key factor in the implementation of integrated vocational education. \( U \) is the benefit utility of higher vocational colleges, then:

\[ U_b = b - \beta(b + c) \] (3)

\[ U_c = c - \alpha(b + c) \] (4)

Therefore, the transformation from secondary vocational schools to higher vocational colleges can be further shown as:

\[ f(x) = w_1 x(1-x) \left[ 1 - \left( 1 + \frac{U_b}{p} \right) y \right] - |\theta|x + |r|(1-x) \] (5)

\[ f(y) = w_2 y(1-y) \left( \frac{e}{u_c} - 1 + x \right) - |u|y + |\epsilon|(1-x) \] (6)

Accordingly, because of the variability of students’ wills, then:

\[ f(x) = w_1 x(1-u)(1-x) \left[ 1 - \left( 1 + \frac{U_b}{p} \right) y \right] \] (7)

\[ f(y) = w_2 y(1-y) \left( \frac{e}{u_c} - 1 + x \right) \] (8)

In the above, the transformation tendency model of integrated vocational education is constructed through matrix \( S \) and \( N \). \( f_{ij} \) represents tendency index of natural transition from secondary vocational schools to higher vocational colleges; \( Y = (y_{ij}) \) represents matrix constructed by \( s_{ij}/n_{ij} \), then:

\[ f_{ij} = \begin{cases} y_{ij}/y_{ij}, i > i \\ y_{ij}, i = j \end{cases} \] (9)

When the value of \( f_{ij} \) is greater than 1, it indicates the tendency of integrated transformation from secondary vocational schools to higher vocational colleges. The greater the value is, the more significant the probability of integrated transformation is. When the value of \( f_{ij} \) is less than 1, it indicates the tendency of natural transformation from secondary vocational schools to higher vocational colleges. The smaller the value is, the more significant the probability of natural transition is. Therefore, through the analysis above, usually with consideration of fairness effect, the integrated vocational education mode will be better than the natural transition to higher vocational colleges. While considering learning time, places and effectiveness, in order to make students' learning outcomes more mobile, with the help of the credit bank system, this paper designs a system design diagram for certification and transformation of learning outcomes in integrated vocational education as shown in Figure 2.
4. APPROACHES TO PROMOTE INTEGRATED EDUCATION UNDER CREDIT BANK SYSTEM

4.1 Optimizing resources and improving the management level of integrated education

The evaluation criteria and rationality of the credit system under the rules of credit bank should be scientifically tackled. Based on the regularity of credit bank, secondary vocational schools and higher vocational colleges, after resource optimization, can establish an interschool or school-enterprise credit transfer and accumulation system, through which each student's credit intermediary function can be established. Generally speaking, integrated education can imitate the monetary management rules of banks to improve its management level. Credits can be managed as currency, through the accumulation by statistical system, to achieve a more comprehensive evaluation of students' learning.

4.2 Deepening teaching reform and cultivating students' ability of application and practice

The development of economy in modern society leads to a more urgent need for professionals for the development of various industries. The emergence of secondary and higher vocational education was to meet the needs of development of industrial economy in society. Furthermore, secondary and higher vocational education provides a feasible way to satisfy the demand of comprehensive talents in modern society. Therefore, in order to further develop secondary and higher vocational education, we need to constantly update and deepen the modern teaching reform, with the process of vocational education activities as orientation, and simulated working scenarios as the characteristics of teaching activities. Teaching reform should also attaches importance to the combination of teaching and practice, highlights the interpretation and exhibition of students' personalities and comprehensive qualities, and cultivates students' continuous innovation ability and practical spirits.

4.3 Improving teaching staff construction and teaching quality

Learning from the rules of banks' credit system, the education and teaching mode of secondary and higher vocational education gives students more elastic and flexible choices for learning time and places. In this context, students can choose their learning time, places and teachers independently, a mode which provides conveniences for the integrated teaching in secondary and higher vocational education. Therefore, teaching staff at secondary vocational schools and higher vocational colleges should go deep into the first line of production, construction, management and service to improve manipulative and practical abilities, making themselves as teachers with double qualifications to meet the urgent needs for vocational education in market economy.

5. CONCLUSION

In short, economic and social development promotes constant progress of the times. Not only is the industrial economy should be constantly adjusted and optimized, but also the education mode should be continually reformed and innovated, because it is related with personal development as well as the nation’s development plan. To this end, the state has continually given guidance and made plans for the teaching mode of secondary and
higher vocational education. Under this background, the emergence of the integrated vocational teaching mode based on credit bank system has made modern society a learning society where everyone can learn at any place. With the help of banks’ currency management system, through the credit bank system, learners can easily access to learning opportunities. On the basis of this, all secondary and higher vocational schools and colleges should establish a lifelong education concept and improve the link-up of integrated vocational education as soon as possible. Integrated vocational education can both satisfy people’s desire and need for learning and make contributions for the sustainable development of the country in the end.

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