A Study on the Optimization Design of the Training Program of Curriculum System for Cross-border E-commerce Talents in Higher Vocational Colleges Based on the CIPP Model

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Abstract

In recent years, China’s cross-border e-commerce enterprises have experienced a rapid growth. The flourish of cross-border e-commerce has effectively promoted the development and the construction of socio-economy, and has gradually become a new model of international economy and trade. By virtue of the strong publicity from the government departments and the media, more professionals are intensely demanded by the cross-border e-business, and a broad space for development is offered to the major of cross-border e-commerce in higher vocational colleges. However, at present, the curriculum system for the major of cross-border e-commerce in a number of institutions are still problematic, which leads to the imbalance of supply and demand in the talent market and seriously hinders the progress of students’ career. On basis of the CIPP model, this paper makes an in-depth study on the optimization design of the training program of the talent curriculum system of the cross-border e-business discipline in higher vocational colleges, proceeds from the content and the characteristics of the CIPP model, discusses four dimensions including the sub-module setting of the curriculum content, the multistep practice of the teaching system, the reinforcement of talents’ professional competency and the construction of a comprehensive practice platform, and elaborates the optimal design of the training program of the curriculum system for cross-border e-commerce talents. On account of this, this paper builds on the CIPP model and constructs a scientific and reasonable teaching evaluation system, which provides a favorable guarantee for the implementation of a training program of curriculum system for talents, elevates the professional skills of the cross-border e-commerce personnel and promotes the core research purpose of China’s economic development.

Keywords: CIPP Model, Cross-Border E-Commerce, Curriculum System, Teaching Evaluation.

1. RESEARCH BACKGROUND

1.1 Literature Review

Currently, the overall demand for the international market has shown a declining trend. Meanwhile, the large-scale manufacturing facilities have been successively moved to Southeast Asia and other countries. In 2016, China’s trade import and export economy decreased by 9%. Specifically, the total amount of export trade fell by 2.7%, and the total import value dropped by 15.4%, resulting in a slow trend of domestic trade and economic development and greater challenges and crises. However, the expansion of cross-border e-commerce has not been affected and showed a growing trend (Sun, 2015). In 2016, the total turnover of domestic cross-border e-commerce was up to 5.7 trillion Yuan, with a growth percentage of 34% compared with last year. According to this situation, the relevant research experts have speculated that, by 2020, the total turnover of China’s cross-border e-commerce will exceed 15 trillion Yuan, and the proportion of the total overall transaction in the import and export trade will rise from 22.3% in 2016 to 39.7% in 2020. In light of this development trend, I believe, in the near future, that cross-border e-commerce providers will become an essential driving force of China’s economic growth, but also the main approach to expand foreign trade in China (Li, 2015). With the rapid growth and development of cross-border e-business, most domestic small and medium-sized foreign trade enterprises have begun to compete and to demand a substantial number of international business professionals, especially the cross-disciplinary and practical talents who are proficient in cross-border e-business professional knowledge, aiming to improve the soft power of enterprises and to expand and occupy the international market. At the same time, a number of well-known domestic cross-border e-commerce enterprises are also in urgent need of these talents (Chen, 2016). In view of the findings of more than 450 cross-border enterprises
conducted by Ariel Institute, 87.2% of the e-business enterprises lack a large number of cross-border e-business talents, and in the next five years, there will be a shortage of more than 478.9 million cross-border e-commerce talents in the market. Although the market is in a strong demand for talents, currently talents of this field are still relatively deficient (Long, 2016). On account of an overview of the existing majors in various vocational colleges, it is almost difficult to cultivate the cross-disciplinary and practical talents needed by the market. The employees in e-commerce enterprises are narrowly qualified after more than a year of pre-job trainings. The shortage of cross-border e-commerce talents will become the key element that hinders the sustainable development of China’s cross-border e-business.

1.2 Research Purpose

In the context of the vigorous development of cross-border e-commerce, on account of the current situation of supply and demand of the cross-border e-commerce talent market, demand clearly exceeds supply and there exists a large shortage of professionals, which seriously affects the growth process of the cross-border e-commerce providers (Zhou, 2016). Therefore, in order to effectively break through the bottleneck, higher vocational colleges should give full play to their advantages and actively take effective measures to strengthen the training efforts of cross-border e-commerce personnel. Based on the contents and characteristics of the CIPP model, this paper has carried on a comprehensive optimization design of the training plan of the curriculum system for the cross-border e-commerce talents in higher vocational colleges. Effective measures are taken, including the sub-module setting of the course content, theological practice of the teaching system, the enhancement of talents’ professional competence and the construction of a comprehensive practice system, to improve the professional skills of the cross-border e-commerce talents, to expand the field of professional knowledge of students, to reinforce the basic theoretical knowledge, and to improve the talent knowledge system (Chen et al., 2016). Besides, on this basis, the CIPP model is adopted; the teaching evaluation system is constructed; the optimization design program is further improved; the quality of personnel training is elevated. Accordingly, a substantial amount of cross-disciplinary and practical talents that satisfy the needs of cross-border e-commerce enterprises are reserved, so as to promote its sustainable development.

2. OVERVIEW OF CIPP MODEL

2.1 Model Content

In 1967, CIPP model is proposed by the American academic expert Stufflebeam based on the progressive elaboration and analysis of Taylor’s action model, which is also known as the evaluation model. It requires the evaluation of context, input, process and product. (Huang, 2016). CIPP is an acronym for the above-mentioned four English words. The evaluation on these four dimensions can bring more favorable information to the final decision and make the decisions more scientific and reasonable. Therefore, CIPP model can also be called as a decision-making evaluation model. Figure 1 indicates the main representative form of the CIPP model.

![Figure 1. Schematic diagram of CIPP model](image-url)
2.2 Model Characteristics

CIPP model holds its own distinctive characteristics including entirety, process and feedback. To be specific, the largest advantage lies in its entirety. The teaching evaluation system not only focuses on the final results of teaching evaluation on the curriculum system, also conducts a preliminary estimation before the optimization of the curriculum system (Zhu and Lu, 2016). In the process of optimizing the design of the program, tracking and feedbacks are made at any time. Furthermore, adjustments are continuously made to the overall curriculum system, and a valuable reference is made to the cross-border e-commerce talents in vocational colleges. Figure 2 demonstrates the characteristics of the CIPP model.

![Figure 2. CIPP model diagram](image)

3. AN OPTIMIZED DESIGN OF TRAINING PROGRAM OF CURRICULUM SYSTEM FOR CROSS-BORDER E-COMMENCE TALENTS IN HIGHER VOCATIONAL COLLEGES

3.1 Sub-module Settings of Course Content

The curriculum system for the cross-border e-commerce talents in vocational colleges should set a main goal of improving the core competence of students majored in cross-border e-commerce. The curriculum optimization program is designed based on the premise of the business needs of e-commerce enterprises, in line with the fundamental principle of promoting the sustainable development of students’ career path (Xu and Li, 2017). The design process should not only attach attention to the linkage between professional courses and job position and also reflect the logical relationship among the courses, at the same time pay full respect for the personality characteristics of students. The curriculum design optimization includes the basic quality module, the theoretical knowledge module, the key course module, the practice training module, the professional development module and the social practice module. The design details are indicated in Fig. 3.

![Figure 3. Module design of curriculum content](image)
3.2 Multistep Practice of Teaching System

In view of the logical relationship among the courses and the work process of the industry, teachers should fully grasp the development rule and the growth characteristics of students and make scientific and reasonable arrangements of the curriculum sequence and the logical structure among them to ensure the smooth connection of all the modules (Du and Liao, 2017). The profession of cross-border e-commerce involves a wide range of knowledge and strong practical operation abilities. Therefore, based on the market demand for e-commerce talents as well as students’ on-campus activities and off-campus internship, a multistep diagram that facilitates the learning of cross-border e-commerce talents is redesigned from the aspect of basic ability, special ability, comprehensive ability, expansion capacity, innovation ability, etc., thereby forming a progressive and rotating teaching practice system with three stairs and five steps, as illustrated in Figure 4.

![Diagram](image)

Figure 4. The teaching system with three stairs and five steps

3.3 Enhance the Professional Competence of Talents

In view of the current development trend of the cross-border e-commerce field, vocational colleges should take effective measures to strengthen the trainings concerning the professional competence of the cross-border e-commerce talents and should be deeply aware of the significance of students’ professional competence that is the major demand for the current large business enterprises. Therefore, according to the relevant survey results, it is concluded that the cross-border e-commerce talents should be equipped with the capabilities of business English application, shop planning and design, network business transaction, virtual platform services, collective collaboration, business management and strong psychological quality, which are also the basic elements and characteristics of competence. In order to further determine the significance of various competency elements, the standard deviation algorithm is conducted. The larger the value is, the smaller the relative stability is, the weaker the representation is.

Standard deviation refers to the specific measurement of the dispersion degree of several data in the group. The calculation process is divided into two steps. The first step is to calculate the average value, and the second step is to derive the standard deviation.

Assume that the real numbers of the data in a group are $S_1, S_2, S_3, \ldots, S_n$, and their mean value is $\sigma$, the formula for the mean value is:

$$\sigma = \frac{1}{M} \sum_{i=1}^{M} S_i$$

(1)

$\sigma$ is the mean value. $M$ represents the number of the features of the overall sample. $S_i$ stands for the number of
changes for a single feature, that is, \( j = 1, 2, \ldots, n \).

Standard deviation is the square root of the variance algorithm. \( S \) is assumed to be an indeterminate variable. If \( G \left\{ \left| s - G(s^2) \right| \right\} \) it becomes the variance of \( S \cdot B(s), T \cdot c(s) \) or \( B_s \), or \( T \cdot c \) or \( B \) can be used. The formula is:

\[
B(\alpha) = \sum_{j=1}^{M} k_j \times (\alpha_j - \sigma)^2
\]

(2)

Specifically, \( B(\alpha) \) is the variance; \( k_j \) is the individual variable probability of \( j \); \( \alpha_j \) is the individual feature variable; \( j = 1, 2, \ldots, n \). \( \sigma = G(s) \) represents the average value. The variance illustrates the dispersion degree of the value to its exception in addition to the situation where uncertain numbers change. The variance and the standard deviation are the most basic, the most important and the most commonly used indexes to calculate the decentralized situation. The standard deviation is more clear than the variance. Therefore, in the process of analysis, this paper employs the standard deviation as much as possible, and the formula for the standard deviation is:

\[
\mu = \sqrt{\frac{1}{M} \sum_{j=1}^{M} (\alpha_j - \sigma)^2}
\]

(3)

To be specific, \( \mu \) is the standard deviation; \( M \) stands for the overall sample feature; \( \alpha_j \) is the \( j \)th feature variable; \( j = 1, 2, \ldots, n \). \( \sigma \) represents the average value of each variable (Hu, 2017). In real life as far as sample standard deviation is concerned, the true overall standard deviation is able to be found only in some very special situations, and the value is not exactly accurate in most cases. Generally, the overall standard deviation is estimated in accord with some randomly selected quantitative samples and the calculated standard deviation of the sample. Therefore, based on the above computational formula, the competence of the cross-border e-commencement talents should be one of the key trainings in the vocational colleges.

3.4 Construct a Comprehensive Practice Platform

Higher vocational colleges are the major bases for the cultivation of professional and technical talents in China. Excellent practical abilities of students are always the most prominent advantage and characteristics of the major vocational colleges, and the practice platform is the key carrier to build up students’ practical skills. In the process of constructing the practice platform, colleges should closely incorporate the requirements of the field of cross-border e-business for outstanding talents. Meanwhile, the principle of school-enterprise cooperation should always be upheld, and the element of enterprise position is included, so as to create a strong and favorable cross-border e-business work environment, to build up a comprehensive practice platform that integrates teaching, practice, entrepreneurship and other aspects, and to provide the students with a solid foundation for future entrepreneurship (Xia, 2016). In addition, higher vocational colleges should continue to strengthen their in-depth cooperation with cross-border electric-commerce enterprises, construct an off-campus practice platform in the enterprises, regularly organize students to carry out practical experience and internship in the enterprises, make all-round efforts to improve students’ professional skills and strengthen their professional qualities. Secondly, the major of cross-border e-commerce in vocational colleges should emphasize innovative and entrepreneurial education that not only strengthens the professional practical ability of students but also improves their overall qualities. Innovative and entrepreneurial education should follow in proper order and advance gradually. First of all, students should receive basic knowledge about innovative and entrepreneurial education, and apply general education curriculum to penetrate the basic concepts and theory of entrepreneurship (Chen, 2015). The following step is entrepreneurship education. In the on-campus practical trainings, schools should explain to students about cross-border e-commerce enterprises and the related knowledge about essential skills by means of the modular teaching method, regularly establish open classes about innovative and entrepreneurial education, and invite successful entrepreneurs to pass on entrepreneurial experience to students and explain more details of the entrepreneurial knowledge. Meanwhile, schools can take advantage of the favorable platform of the cooperative cross-border e-business enterprises and arrange students to successively experience the enterprises in accordance with the class rotation system. The last step is entrepreneurial guidance. Students with outstanding comprehensive performance are selected from the practical training and competition to constitute an entrepreneurial team. By virtue of the school-enterprise cooperation, special personnel are dispatched from the enterprises to guide the entrepreneurial team. Besides, schools should provide appropriate assistance funds and comprehensively support students to start the path of entrepreneurship.
4. CONSTRUCT A TEACHING EVALUATION SYSTEM FOR THE TRAINING CURRICULUM OF CROSS-BORDER E-COMMERCE TALENTS BASED ON THE CIPP MODEL

CIPP model is applied to the optimized design of training program of curriculum system for the cross-border e-commerce talents. In this way, a more comprehensive and accurate evaluation can be conducted on the teaching system after the optimization design; the curriculum system is further perfected; a favorable reference can be offered to teachers in terms of changing the teaching concept, adjusting the teaching methods, enriching the teaching content and other aspects; teachers are guided to make a continuous improvement of their curriculum system design, so as to provide students with more high-quality teaching services and to enhance the professional skills of cross-border e-commerce talents, thereby ultimately achieving the goal of personnel training. Figure 2 illustrates the content of the evaluation system model constructed on the basis of the CIPP model.

![CIPP model content diagram](image)

**Figure 2. CIPP model content diagram**

4.1 Identify the Index of the Evaluation Teaching System

According to the CIPP model, the objectives of the teaching evaluation on the cross-border e-commerce system mainly include the following categories. First, the following content should be evaluated, including the transformation, the deepening and the reasonable degree of the teaching concept, the teaching goal and the teaching plan. Next, concerning the input, the evaluation involves the comprehensive strength of the teaching team, the construction of the practice teaching platform and the abundance of its equipment, as well as the investment of education funds in the practice teaching. Furthermore, the main evaluation on the process focuses on the expansion and the richness of teaching content in the curriculum system, the originality level of teaching model and the elaboration of the link of teaching monitoring. The last step concerns the result, and it is necessary to evaluate the practice situation of students, the innovation progress of the practice teaching program and the acceptance level of enterprises for students.

4.2 Calculation and Verification of Evaluation Index Weight

The algorithm of evaluation index weight selects the stratification method, a systematic type of analysis method. The problem-solving ideas are applied. Each two elements are divided into one group for the comparison and the judgement of the significance degree of various factors. Then, the weights of the factors are calculated according to the normalized calculation (Yang, 2015). This method is frequently applied in case of crucial decisions featured with complication, a number of system structures and strong subjective color and other aspects, and it is more commonly adopted in the calculation of evaluation indexes and weights. Therefore, through a detailed consultation with professional teachers and education experts, the problem of a large value difference is integrated; the Delphi method is applied to re-adjust the inquiry; a relatively scientific and reasonable evaluation table is concluded to represent the significance degree; a judgment matrix for the weights is established. The details are indicated as follows.
The computational formula for matrix normalization is $\text{Sk}_{kj} = \frac{r_{kj}}{\sum_{i=1}^{m} a_{ki}}$, where $k$ and $j = 1, 2, \ldots$. Based on this formula, the overall situation of the normalization of Matrix S of is calculated:

\[
\begin{align*}
\sum_{i=1}^{5} a_{i1} &= 1 + \frac{1}{2} + \frac{5}{2} + \frac{3}{1} = \frac{19}{3} \\
\sum_{i=1}^{5} a_{i2} &= 1/2 + 1 + 1 + 2 = \frac{13}{3} \\
\sum_{i=1}^{5} a_{i3} &= 3/7 + 2/3 + 1 + 1 = \frac{37}{15} \\
\sum_{i=1}^{5} a_{i4} &= 3/1 + \frac{1}{2} + 1 + 1 = \frac{15}{5}
\end{align*}
\]

At the same time, on its basis, the calculations are tested and the specific test formula is:

\[
\beta_{\text{max}} = \frac{1}{m} \sum_{i} \left( \frac{\text{SY}_{i}}{\gamma_{i}} \right)
\]

The final distribution result of the weights is as follows:

\[
S_w = [0.085, 0.174, 0.424, 0.286]
\]

\[
G1_w = [0.213, 0.312, 0.548]
\]

\[
G2_w = [0.467, 0.253, 0.386]
\]

\[
G3_w = [0.341, 0.759, 0.233]
\]

\[
G4_w = [0.648, 0.259, 0.384]
\]

Therefore, in accord with the final results, the optimized design of the training program of curriculum system for the cross-border e-business talents in higher vocational colleges should further reinforce the link of practice teaching. Specifically, colleges should actively carry out school-enterprise cooperation and strengthen in-depth cooperation with major business enterprises. Besides, teachers should make an active transition of the teaching concept, continuously innovate the teaching methods, and expand the teaching content (Dong, 2017). Furthermore, students should take full advantage of the favorable platform and high-quality learning conditions afforded by colleges and teachers, elevate themselves through a variety of effective channels, learn more professional knowledge and improve their overall strength.

5. CONCLUDING REMARKS
The prosperous development of cross-border e-commerce effectively drives China’s foreign trade, promotes the national economic construction and provides a broad advancement space for a larger population. However, at present, there exists a large shortage of cross-border e-commerce talents in the market, and the needs of e-commerce enterprises can not be satisfied. Therefore, in the face of such a grim development situation, this paper makes an in-depth study on the training program of curriculum system for cross-border e-business talents. It is proposed that the curriculum should conduct a sub-module design and the teaching system should be practiced in a step-by-step form, meanwhile, talents’ competency should be enhanced and an optimization design path of the comprehensive practice platform should be constructed. What’s more, through the analysis on the contents and characteristics of the CIPP model, an evaluation system is built up on basis of course teaching, and a comprehensive evaluation analysis is carried out on the optimized curriculum system. The aims are to provide a more favorable reference for the training of cross-border e-commerce talents, to perfect the curriculum system, to all-roundly improve students’ professional skills, to enhance their overall quality in order to meet the needs of the cross-border e-commerce market, and to achieve the sustainable development of cross-border e-commerce enterprises and students’ career life.

REFERENCES

Hu H.(2017). Research on talent training and curriculum system construction of high skilled cross-border electricity supplier, China market, (20), 204-205.
Huang J. (2016). Research on the training of international trade talents based on cross-border electricity suppliers, cooperation in economics and technology, (22), 128-130.