

Expanding Usability of E-Training System in ERP Education

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Abstract—This article presents the prosperous enterprise resource planning (ERP) course layout aiming at the current problems from six aspects of the curriculum, teaching content, teaching resource, teaching method, teaching evaluation, teacher training. Furthermore, it provides the implementation procedures. In addition, it demonstrates the empirical outcome and achievement promotion. The final result proclaims that the practice method of e-ERP sandbox simulation through teaching reform is feasible.

Index Terms—enterprise resource planning; sandbox; teaching reform; layered progression method

I. INTRODUCTION

With the rapid development of enterprise IT infrastructure, ERP (Enterprise Resource Planning) application has been becoming more and more popular, comprehensive [1]. Meanwhile, the demand for ERP human resources soars as well. And therefore, it is appropriate solution to introduce e-ERP sandbox course into the university syllabus for the sake of meeting the demand for ERP human resources. Under such circumstances, the high education integrated information technology deals with the challenges and requirements from the public. However, there remains doubts how to carry out the teaching practice of e-ERP sandbox simulation, and how to help the students understand and master the cutting edge knowledge and skills, which require the pedagogues exploring and researching these fields [2,3].

The purpose and significance of this research are to explore the teaching method of ‘Problem oriented, Performance developed’ based on the research object through the e-ERP sandbox simulation as one core course of Information Management program [4]. In terms of the determined knowledge structure and skill requirement of the occupation vacancies, it develops curriculum system and establishes a real-world teaching practice system. Additionally, it has a cooperative relationship with the famed software companies (YONYOU, Kingdee, etc), which provide the simulation laboratory, practice base, training centre and internship position as well as compile the suitable lecture notes and text books [5]. Finally, the student overall performances satisfy the demanding requirements from the career market.

II. BACKGROUND

It is quite common that "e-ERP sandbox simulation" as one core course of Information Management Program is applied to enterprise management through its information technology. This course target matches the job vacancy precisely. It concentrates on the engineering knowledge,

which requires persons from multi-disciplinary background [6,7]. Thus, the teaching atmosphere should pay attention to the cooperation with industry, which could create real context. The content and system before the reform, however, have the flaws below.

(1) The teaching objective is not very clear. ERP is the enterprise resource planning system, which includes four main functional modules of sales management, procurement management, inventory management, financial management. It would be more complicated, when integrating the value-added application modules of human resource management and customer relationship management. In light of the complex system, it prefers the persons from multi-disciplinary background. Nonetheless, it does not comply with the current education target, which emphasizes the professional graduates, oriented by employment. The unintelligibility teaching objective leads the contradiction between teaching and learning. In addition, it is difficult to guarantee the quality of teaching.

(2) The teaching content is full of academic and theoretical knowledge, but lack of the ability toward the targeted post. The textbook in most universities is provided by the software companies. Accordingly, the experimental operation is the main content. It is difficult for the students to master and understand the relevant responsibility and professional knowledge, which brings the great obstacle to the e-ERP sandbox simulation course. In addition, the nuance between the ERP software for university version and the ERP software for enterprise version is almost same, but some restrictions of the user authority. The actual operation of the ERP software could not be transplant to the classroom atmosphere with little consideration to the characteristics of teaching classroom. For the classroom atmosphere, it is essential to create one virtual enterprise in the classroom. Otherwise, the teaching outcome would lead one large deviation inevitably, influencing the expected teaching effect negatively.

(3) There is a shortage of ERP faculty and staff. It is one big issue for university ERP education that there is a shortage of ERP faculty and staff. ERP course is an emerging course, covering a wide range of knowledge and practical experience. It requires the lecturers possessing not only the background of elementary knowledge but also professional operation and system management skills. Nevertheless, the current ERP teachers do not have such backgrounds, most of who are from the relevant career. They tend to emphasize their professional knowledge during their teaching process. Though some teachers have learned the professional ERP course by themselves, they suffer from a lack of the practical implementation of ERP, which leads a shortage of comprehensive ERP faculty and staff. The serious shortage of ERP faculty influences the

teaching quality of the e-ERP sandbox simulation course, which leads to a negative effectiveness of practical implementation and experiment.

(4) The teaching system status appears one closed "College" style, highlighting the theory learning and ignoring the practice learning, which does not meet requirements of the course characteristics and teaching target. Especially the ERP sandbox simulation course lacking of control standards, students tend to focus on the operating outcomes, neglecting the management decision-making process. Therefore, there is a need to reform the teaching system, in order to establish the formation of 'production, teaching and research' mode, to improve the current laboratory, practice base, training centre and internship position. It is essential to sign a cooperation protocol with the partners such as YONGYOU, Kingdee software, Alibaba, Sunyard. Under such circumstances, it would be a better atmosphere of network, multimedia and simulation in laboratory, practice base, training centre, while a more closed, deep and cooperation with the partners.

In light of the course status, function and beneficiary student number, current situation, there is a need to further the teaching reform and innovation on the content and system, on the basis of the setting industry background of 'e-ERP sandbox simulation course' mentioned above.

III. RESEARCH CONTENT

According to the Information Management program requirements, it is necessary to set a clear program position and teaching objective, which is fostering high-quality professional talents relying on related industry and taking the employment as the priority. It deploys the teaching method of 'Problem oriented' as the main line to set the curriculum system. It selects the teaching content on the basis of the professional ability. It constructs the curriculum structure on the basis of position task. It implements the teaching process based on the actual situation, and develops the course system in six aspects from the curriculum, teaching content system, teaching resources, teaching methods, evaluation, teacher training, curriculum system.

(1) To pursue the moderate and necessary curriculum reform driven by 'Problem oriented', it develops the course according to the actual position requirement. Furthermore, it restructures the course system and strengthens practical application based on the theory of course restructuring.

(2) Considering the complexity and systematicness of the ERP, it deploys the layered progressive mode for the sake of students' learning and understanding. It will be divided into 4 layers: the first layer-ERP theory learning; the second layer-ERP sandbox simulation learning; the third layer-the ERP software learning; the fourth layer-the e-ERP practical learning. The students from different grades and background should not be taught by the same teaching content. According to the different characteristics, the students should be treated through different emphases, as shown in Figure 1.

(3) The optimization target of teaching resources can be achieved through three aspects as follows. One is that it is better to be provided for the students with the high quality ERP textbook. Having insight into the ERP theory course, they would have a deep understanding of ERP software, and tend to have the ability to complete the task respect-

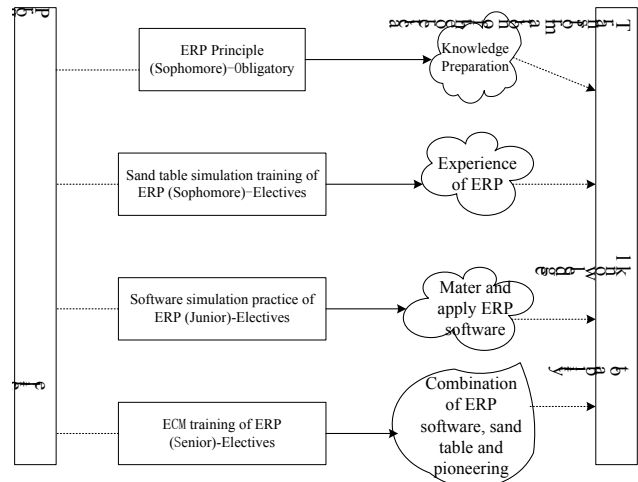


Figure 1. The course content layered diagram

tively. Two is that it is better to be provided for the students with the high quality ERP software. The suitable data could be collect to meet the teaching needs. Three is that it is better to establish the laboratory, practice base, training centre with the partners as the development of teaching resources. It would arouse the students' enthusiasm and broaden the students' perspective.

(4) The ERP course covers a wide range of knowledge and practical experience. It requires the lecturers possessing not only the background of elementary knowledge but also professional operation and system management skills. A deep ERP course requires a variety of teaching methods to arouse students' enthusiasm extremely and to achieve the integration of teaching and learning.

(5) Taking the problem solution as the main line, it is better to help the students solve the problem by their own knowledge through the mode of 'the problem founding -- the problem solution'. The knowledge application is a reciprocating and iterative process. After that, according to the students' completion, there would be an appraisal on their ability of knowledge application.

(6) The growth of ERP faculty is stemmed from the constructing of teacher team, the members of whom are from different occupations and backgrounds. They could form a virtual laboratory, where they assume the ERP course assignments, sharing the division and cooperation. Moreover, it is an urgent issue to improve the faculty ability during the ERP teaching. Certainly, it could be usually achieved through the corresponding positive policies to encourage the teacher to participate in various training projects and through the introduction of more excellent talents.

IV. METHODS AND PROCEDURES

The research method and process of this article is divided into three phases and six procedures. The task of each phase is completed as follow.

An Analysis on Market --The logic starting point of course reform is the solution toward accurate positioning problems. Mainly based on the analysis of human resource market survey, it would be the occupation survey integrated with the objectives of profession oriented.

An Analysis on Program Scheme of Fostering Talents--Based on the analysis of market demand, taking the employment as the guidance, it is essential to introduce the

professional and technical requirements into the program scheme and teaching content.

An exploring toward the course construction system-- It is fundamental to highlight the substantial reform concentrating on the employment guidance. Meanwhile, it is vital to implement the course setting principles, course platform selection, course content reconstructing, course standard formulating, course situation creating and course implementation and evaluation.

The corresponding six exhaustive procedures are explained as the following paragraphs.

(1) The market demand analysis consists of employee situation, market supply and demand situation, the surplus or shortage of the professional and technical vacancy, the number of actual qualified persons etc. It is crucial to pay attention to the course extension of new occupation and job vacancy information in order to predict 3-5 year trend of supply and demand of professional and technical human resource. It is utmost to make a detailed field investigation and inquiry on the technology industry responsibilities, institutional, technical work distinction, work condition, work content, work environment, remuneration, which will be conducive to the construction of occupation ability module and curriculum.

(2) It is significant to organize the career experts, academic experts and experienced management operation personnel to analyze the vacancy required technical ability, to analyze the employment trend combined with course and occupation. According to profession and position, delimit employment into responsibility, and divide the responsibility into the assignment. Consequently, determine the capabilities needed for the performance of their duties. Furthermore, identify the core professional capability (the utmost professional capability). After that, delimit the core professional capability, and determine the professional module supporting some core competence. It is obvious for the scheme of the core professional capability to cover the theory knowledge, practical teaching content, professional and technical module, time scheduling, conducting regulation, work willingness, training equipment, tools, materials, etc.

(3) It is of significance to reconstructing the course system based on the seminar, and to determine the periodical target toward the capability. Based on the analysis of working assignment, taking the problem orientation as the main line, select, accept or reject the knowledge according to whether it could solve the problem. It focuses on training process of the student solving the problem, but not the remembering the knowledge in memory, through the integration of theory and practice taking the problem orientation as the main line. Then, formulate the corresponding e-ERP sandbox simulation course standard. Under this course framework designed work structure, it could demonstrate completely the characteristics of Information Management professional education.

(4) Taking the typical business process as the paradigm, set the periodically practical project. Having determined the e-ERP sandbox simulation course system and course standards, it would construct the business operation process, taking the typical business process as the paradigm. During the process of operation, taking the problem orientation as the main line, it would integrate the knowledge and technical skill in order to stimulate students' learning drive. The understanding of knowledge and skill driven by

practice indicates the professional and practical distinctions of e-ERP sandbox simulation course setting.

(5) Adjust the course proportion of practice and theory. ERP sandbox simulation course system is the integration of theoretical reason and practical reason. At present the reform trend of e-ERP sandbox simulation course is to increase the quantity and quality of practical course. For most of the e-ERP sandbox simulation courses, it is appropriate to maintain some tension between theory and practice. The practical teaching should mainly arrange the high technical content and intellectually creative content, strengthening the teaching content of practice process, operating rules, technical specifications. Meanwhile, the theory teaching should highlight the basic foundation, cultivate application technology, and refine the capacity of knowledge. The teaching content should be selected carefully for the sake of help students mastering the concept and strengthening the knowledge application.

(6) It is crucial to establish the appraisal mechanism of course system. The problem oriented e-ERP sandbox simulation training evaluation method concentrates on the basic operation of the business process during the ERP training. The students would be evaluated in terms of their analysis and outlook on the problem solution correctness in the training content. In addition, the students would play a corporate role, completing the role assignment with independent effort or with group work. The teacher will assess the students' outcomes for according to their performance, including the job vacancy understanding, role status, assignment processing situation.

V. ACHIEVEMENT AND PROMOTION

There is a long term effective research on the ERP course including pre-session course formation, teaching material construction, informatization teaching method and practical content setting during the years of exploration, integrated with the characteristics of ERP course and the course target of Information Management and Information System. The teaching content has been gradually deployed in the curriculum, which is effective. And the achievements are presented as follows:

A. The Elective module setting

Before learning the ERP course, it is crucial to learn the management and computer knowledge based on the general characteristics of ERP course. According to ERP requirements, we modify and improve the relevant contents and curriculum of information management and information system. And the reasonable teaching system is formed gradually. The path diagram of ERP course learning system is illustrated in Figure 2.

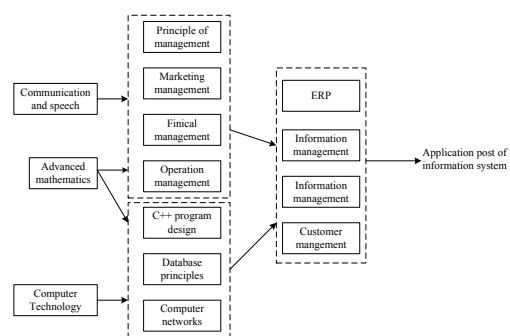


Figure 2. Path diagram of ERP course learning system

According to the schedule of teaching curriculum, ERP course is arranged at the sixth semester for the Information System Application program students. From the above illustration, we can conclude that before learning this course, the students have already learned the modules of management, marketing, financial management, production and operations management, C++, database principle and computer networking. Through these prerequisite modules, the students have the management theory, finance, marketing, production and other business knowledge as well as the computer knowledge, which is a good foundation towards learning ERP course. With such good knowledge structure the students do not need to supplement the basic knowledge of management and computer.

B. The Textbook Compiling

There is a history of four years which ERP course is lectured in this school. It is of significance to have textbook and teaching materials during the teaching process. Some textbooks are discovered the advantages of a strong theoretical and comprehensive introduction to the ERP content during in the teaching process, whereas these materials has the disadvantages of no prominent highlights, no vital and specific content, no practical content. There are requirements to meet better teaching process, to meet the teaching objectives integrated with theory and practice for the sake of professional and comprehensive talents. Accordingly, SAP platform, ERP platform are introduced to this school. Through the actual application background material, and the current good information resources, the ERP ppt teaching materials are compiled, which are suitable for professional training objectives. The compiled textbooks are not only with theoretical explanation, which is easy to understand, but also with the introduction of the specific functions of ERP platform, which integrates the theory and practice. The textbook demonstrates very strong operability and readability, especially the systematic, real-time, professional knowledge.

C. The design of Practice Process

ERP is a program highlighting practical content. Besides the completing the necessary theoretical content in the current teaching syllabus, more attention should be paid to the cultivation of students' practical ability.

- a) Integrating the theory and practice, highlighting the practice content proportion
- b) Highlighting the practice content, establishing the practice base and training centre

This school is located in the Xiasha Economic Development Zone, Hangzhou, China, where there are a lot of software enterprises. Through the cooperation relationship with them, students can practice their theory in the enterprise, and can understand the process of the actual development and the ERP system application. It would greatly arouse students' interest in learning the curriculum, improving teaching result. In 2010, this school welcomed one great opportunity that this school signed an agreement with the famous software company JINSHEN Logistics for strategic cooperation, which promoted the construction of ERP course greatly. This school is preparing the knowledge learning and practice system of customized SAP software for Information Management and Information System program students. It would provide a large

number of international, professional talents for the informatization development of Chinese enterprises.

(4) The application of informatization teaching method

With the development of information technology, the leading traditional "blackboard + chalk" mode has been transformed greatly. Information technology has entered the traditional classroom. Multimedia, network and other new technology means has substituted for the "blackboard + chalk", making the classroom teaching more vivid and more effective.

This school initials the informatization teaching reform work very early. It is prevailing that teaching reform is to comprehensively implement the teaching content, improve teaching efficiency, and reform the teaching method. As the students have computers respectively during the lectures, this course of informatization teaching integrates the computer teaching mode in the school. It makes full use of informatization, networking teaching resources, transforming the teaching resources into informatization and course implementation process into informatization. Gradually it forms a teaching system of three-dimensional course with Neusoft teaching characteristics.

1) Managing the teaching resources through the informatization method

According to the course developing and actual needs, the detailed before-class, in-class, after-class designs are in consideration. One ERP course website is developed. The teaching requirements, courseware and other related information are uploaded to the site. There is an online teacher office. Through this platform, teachers and students can communicate at any time after the lessons, which promotes good teaching atmosphere. During the teaching reform in the past two years, ERP courses has paper-based textbooks, electronic materials, guidance books, case library, teaching practice platform, PPT, network teaching system etc. Obviously, there would be a great effort to eventually establish one comprehensive teaching resources management system of the combination of multimedia materials, textbooks, network courseware, online resources and the network environment.

2) Implementing the teaching process management through the informatization method

The multimedia teaching and broadcasting teaching are applied completely rather than the traditional teaching mode of "blackboard + chalk". Through the reasonable, timely, effective use of modern educational technology and multimedia teaching, it improves the teaching efficiency. The school encourages the students to think independently during the lecture, stimulates the students' initiative, and cultivates students' scientific willingness and innovative consciousness. Meanwhile, the heuristic discussion teaching is also applied with the case studying, speaking practice methods. Take case studying for example. We analyze the case according to the teaching content, and design a series of classroom discussion topics. The topics will be hand over to the students in advance. After discussing the problems, the students could have a deep sight into the problems via networking source. In the classroom, students are encouraged to present their ideas to the others. Through the case studying method, it enables students to grasp the theory knowledge more deeply. The application of these teaching methods plays a positive role in improving teaching efficiency and teaching quality.

VI. CONCLUSIONS

From the promotion and popularization perspective, this project constructs one 'Industry, University, Research' combination of laboratory, practice base, training centre on and off campus. It also establishes the long-term mechanism of 'Industry-University cooperation based on mutual benefit'. It designs two electronic warfare training comprehensive experiments associated with the ERP (ERP sandbox simulation experiment, e-ERP enterprise business operation competition experiment). Each year, the students participating in the training cover the programs of Information Management and Information System, Electronic Commerce, Logistics Engineering. The total number of students participating in the training is more than 100 students each year. The additional three young teachers' scientific research ability are improved significantly, which promotes the "e-ERP sandbox simulation" teaching team construction and curriculum development. Moreover, it drives the whole teaching reform and research. In addition, the student teams mainly from the Information Management and Information System program won the successful achievement of one first prize, two second prizes in the national e-ERP enterprise business operation competition game.

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