

Research on The Construction and Reform of IT Practice Teaching Base in Higher Learning Institutes of Finance

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Abstract

Cultivation of students' IT practice and innovation capacities is an important aspect of higher learning institutes' educational reform. As one of important teaching links IT practice teaching plays a key role in training high-quality IT application talents for the modernization construction. The paper starts from strengthening financial major students' IT application capacities and makes a research in construction and reform of IT practice teaching base in higher learning institutes of finance with an emphasis on expounding the reform in construction of experimental teaching environment, practice teaching contents and methods and exploring the main methods and their effects in new talent cultivation models in higher learning financial institutes.

Index Terms: Comprehensive Practice Teaching Environment; IT Talents Cultivation; Experimental Teaching Platform

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1. Introduction

Computer Information Engineering School of Shandong University of Finance has always attached much importance to the construction of IT practice teaching base, made some achievements in construction of experimental teaching facilities, teacher contingent and curriculum system and formed its own distinct characteristics of serving financial informatization construction as the main aspect, being strong in data management and information security, and focusing on open cooperation as well as cultivation of students' practice and innovation capacities. It has accomplished all the intended tasks, forcefully pushed forward the in-depth reform of practice teaching and enhanced the quality of talent cultivation

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2. Construction of IT Practice Teaching Base

During the period of constructing the IT practice teaching base and through constructing soft and hard facilities of computer laboratories Shandong University of Finance has gradually developed and owned one institute of computer technology and five categories of teaching and research laboratories on the original basis such as data mining and decision support system, computer networks and information security, system structure and embedded system, e-commerce and e-government and software engineering. So far the college has owned 17 laboratories and 1288 teaching-purpose computers that support 7 first-class disciplines such as economics, management, law, literature, natural science, engineering and pedagogy and cover the whole college's 43 undergraduate programs, and junior & adult education. The construction work mainly includes the following aspects:

A. *Increase of Funding in Soft and Hard Engineering Construction of the Experimental Center*

Since last year it has accumulatively invested over 4 million yuan in purchasing experimental apparatus and building up teaching software. Among the funds the provincial special fund and self-raised fund for purpose of laboratory construction were used to purchase experimental apparatus and related facilities. The college also arranged the special fund from the quality engineering program to support lab classes and teaching contingent. It has newly increased a lab area of 1263 square meters and accomplished the scheduled goal.

In accordance with the college's developmental planning and social demand for IT talents the college has undertaken the soft and hardware engineering construction of the experimental base, and improved practice teaching conditions as so to further widen the center's radiating surface. In addition to the experimental teaching tasks of 4 undergraduate programs of computer information subject (computer science and technology, information management and information system, e-commerce, information and computing science) and 2 postgraduate programs (management science and engineering, computer application) the experimental teaching base has also undertaken the teaching experimental tasks of computer basis, soft and hard ware technological basis, and computer-related courses, comprehensive experiment, professional practice and social service, etc. for 15412 students of the whole college concerning such disciplines as economics, management, literature, law, science, engineering and education with a broad beneficial influence. It has totally opened 31 experimental courses, 7 curriculum designs and 221 lab projects. So far the soft and hardware environment can better meet the requirements of higher learning institutes of finance in cultivating talents.

B. *Integrating and newly Building Labs*

On basis of the existing labs the teaching base has integrated and newly set up these labs and by taking the measures of intensifying functions and specialization it has increased continued construction of the specialized labs of computer networks, high performance computing and e-commerce. It has also integrated the labs of computer basis, computer application software, principles of microcomputer and interface, and principles of computer composition, etc. and intensified other specialized labs so that the management center has much rationalized and systemized the lab construction and accomplished the planned target.

(1) It has intensified construction of the existing labs. For instance, the whole college oriented computer basis labs have developed from one campus into both east and west campuses.

(2) It has set up new labs in order to meet the requirements of the college in cultivating talents and developing new technologies. Since 2009 while improving the existing labs it has invested capital in purchasing equipment and setting up new labs, mainly computer networks, high performance computing and e-commerce labs so as to intensify their functions.

(3) It has integrated experimental and teaching resources to enhance experimental and teaching effect. In order to make efficient use of experimental and teaching resources it integrated the specialized labs of computer application software, microcomputer principles and interface, computer composition principles, etc. In 2009 it integrated the experimental and teaching functions of the original labs so as to meet the requirements of IT basis and specialized experimental and teaching work.

So far it has owned 17 specialized labs in 5 categories such as data mining and decision support system, computer networks and information security, system structure and embedded system, e-commerce and e-

government and software engineering. It becomes an excellent base that has integrated teaching, scientific research and social service into one with beautiful environment, qualified teaching contingent, more experimental projects, broader coverage and strong service functions.

C. Improving Cultivating Programs and Building up new Experimental and Teaching System

In line with the enhancing teaching quality activity launched by the college we have reformed the experimental and teaching system. In 2008 we revised the undergraduate teaching and cultivating programs. IT became the main orientation including the practicing areas of computer basis, major basis, major courses, etc. The reform has highlighted the advantages of multi-layer, modularization and on-line teaching system with an emphasis on the organic integration of experimental and teaching contents with scientific research, applications with practice and basis with leading edge development. In terms of credit ratio we have increased proportion in the three aspects such as knowledge imparting, capacity cultivation and quality enhancing, particularly in links of experimentation, course exercise, major practice and technological innovation. In the new experimental and teaching system we have built three platforms: basis, application and innovation, and made a split-level design of experimental contents. In the platforms most of experimental courses are divided according to their nature into three categories of basis & verification, design & synthesis and research & innovation.

Since 2008 we have developed 12 curriculum design courses such as Java Programming and opened up 122 new experimental projects. So far the opened experimental projects have totaled 221 of which 122 are newly developed ones. In the course of project development the experimental teachers made a full use of computer-assisted teaching software to increase the enhancement- and innovation-typed projects. The newly developed 122 experimental projects consist of 28 basis projects, 62 enhancement and 32 innovation ones.

D. Sharing Resources and Serving the Goal of Cultivating Higher Financial Talents

The experimental center offers services of IT sort to all students of the college. There are 1288 sets of computers available for students 12 hours a day and 7 days a week so that IT can be fully used and resources shared. The center also pushes actively forward the construction of experimental teaching information platform including the construction of network experimental teaching resources, lab informatization and networking. It has its own independent website (<http://www.sdfi.edu.cn/lab>), on-line classroom (<http://oa.sdfi.edu.cn/class>) and quality course website (<http://www2.sdfi.edu.cn/netclass>). Besides, the center has also undertaken the research in the talent cultivating mode of on-the-spot teaching reform, production-teaching-research integration and college-enterprise cooperation. In 2007 the Computer Information Engineering School of the college was approved as Jinan municipal software outsourcing talent cultivation base and it joined efforts with several software enterprise to build practice and innovation bases.

E. Strengthening the Construction of Teaching Contingent and Enhancing Experimental Teaching Level

(1) Strengthening the construction of scientific research and teaching teams. The two scientific research teams of Management Science and Engineering, and Computer Application affiliated with the center have been selected as the first- and second-batch scientific research teams of Shandong University of Finance. The discipline of management science and engineering is also the key subject at the provincial level and one of the college-planned three key doctoral programs. The IT practice teaching team was listed in 2009 as the second batch of teaching teams by Shandong University of Finance. In 2010 "A Study on IT Practice Teaching System and Its Contents in Higher Learning Financial Institutes" (2009341) has been approved as a teaching reform project of Shandong higher learning institutes.

(2) Strengthening the training of experimental teaching contingent. From 2009-2010 each year special funds have been arranged for supporting the exchange and cooperation with famous institutes home and abroad, the major experimental teaching software training, the training of comprehensive experimental faculty and the training of new technological development. Among the faculty 22 teachers have doctoral degree and 4 teachers have experience of studying abroad for more than one year. A strong and sustainable teaching contingent has taken shape with high education backgrounds, and young and middle-aged teachers as the main force.

3.Results of IT Practice and Teaching Base Construction

The base has achieved the following results by investing more funds in purchasing experimental apparatus and teaching software, training experimental faculty, enhancing their teaching level, integrating and newly setting up labs, developing new experimental courses, establishing and improving lab management rules, improving and expanding lab functions and implementing earnestly the construction programs.

F. The Practice Experimental Teaching Work Has Realized a Broad Coverage and Resource Sharing

Through construction of the project's soft and hard wares the practice teaching conditions have been much improved and the base's radiating areas further expanded. In addition to the experimental and teaching tasks of 4 undergraduate programs (computer science and technology, information management and information system, e-commerce, information and computing science) and of 2 postgraduate programs (management science and engineering, computer application), the experimental teaching base has also shouldered the teaching experimental tasks of computer basis, soft- and hard-ware technological basis, and computer-related courses, comprehensive experiment, professional practice and social services, etc. for the whole college concerning such disciplines as economics, management, literature, law, science, engineering and education with a broad beneficial influence.

G. Strengthening the Cultivation of Students' Innovative Spirits and Enhancing Their Job-finding Competitiveness

We have strengthened the cultivation of students' innovative spirits in order to enhance their job-finding competitiveness and ensure them to become useful persons. We have attached much importance to enhancing students' comprehensive quality and practical innovation capacities, particularly their IT application capacities, and actively expanded their employment channels and tried to enhance their employment competitiveness. We have strengthened the cultivation of students' innovative spirits, earnestly organized all sorts of pre-job training, experimental and practicing links and pertinently undertaken all tasks together with related enterprises. On the basis of course instruction we have also organized all sorts of computer-related practices and established the guiding committee of undergraduate contest directing students to participate in software and foreign language contests, and to form studying groups of science and technology. Through academic reporting, computer after-school-activities and various training programs we have constructed fuller academic scientific research atmosphere and built a better experimental technique and innovative practicing platform for cultivating high quality innovative talents. As for graduating classes we have provided students with expertise guidance with focus on the linking work of teaching, practice and graduation project so that they can lay a good foundation for future employment.

In the past successive years since 2008 we have provided special labs to conduct expertise training for the graduating students in summer vacations, cooperated with software companies such as NEC to train their capacities of software development and foreign languages and achieved good results. Our graduates have generally received a good appraisal by their employing units. In recent three years about 200 graduates from the computer school of the college have been employed by various software companies within the province such as Huawei, Inspur, CVICSE and many IT enterprises in Qilu Software Park. There are 50 graduates who have passed the exams and became government servants, one of whom was even employed by the Foreign Ministry in 2009. So far There are 10 graduates now working in our national ministries and commissions such as the Ministry of Foreign Affairs, the Ministry of Public Security, the General Office of the State Council, the Central Organization Department, the General Administration of Customs, etc. Nearly 50 graduates every year can pass the entrance exams and be admitted by such famous universities as Tsinghua, Renda and Tongji.

H. The Activities of the Teaching Practice Base Have Achieved Fruitful Results

In recent years the students of our school have achieved gratifying results in Qilu Undergraduate Software Design Contest and National Computer Contest:

In 2003 they won the Team Excellence Award; In 2006 they won respectively one second-class and one third-class awards; In 2007 they won one first-class award, 4 second-class awards and one third-class award; In 2008

they won totally 3 first-class awards, 3 second-class awards, 10 third-class awards and 5 excellence awards. The awarded students have reached 100. They have also won several team awards. In the finals of Beijing Undergraduate Embedded Software Design Contest our team won the second-class award. In Beijing Sixth National Higher Learning Institutes GIS Contest the works developed by our team were prized with the third-class award. On 4th December in 2009 our team was prized with one second-class award and 6 third-class awards in the software design match of the Seventh Qilu Undergraduate Computer Software Contest. In Shandong Competition Area of the National E-Business Contest they won 2 second-class awards and 2 third-class awards and in the National Undergraduate (of arts) Computer Application Contest they won one excellence award.

Respectively in 2008 and 2009 the Computer Information and Engineering School has been awarded the title of “Qilu Software Park Institute-Enterprise Talent Exchange Program Excellent School(Department)”. On 29th March in 2008 our school made a specialized speech to introduce our experience of cultivating talents in the seminar of the provincial Undergraduate Computer Innovation and Software Contest conducted by the Computer Education Research Specialized Committee of the Shandong Higher Education Society and Jinan Computer Society. On 28th November in 2008 the media of Shandong Education TV Station and Shandong Commercial News respectively reported our school’s computer software contests and students’ scientific innovative activities. Shandong Education TV Station even broadcasted the exclusive interview with our three excellent students like Mr.Liu Jiejun.

The main teaching research achievements are as follows: “Study and Practice Upon Undergraduate Teaching Quality Construction of Shandong University of Finance” which was appraised in 2009 as a first-class award in Shandong provincial excellent teaching research achievements; “2009 Research Project Upon Shandong Higher Learning Institutes Educational Reform” (A Study on IT Practice and Teaching System and Contents) has been approved by Shandong Education Depart as a study project; In 2010 the course of “Database Principles and Applications” has been approved as a Shandong provincial level quality coursework; In 2008 “Computer Practice and Teaching Team” was approved as the second batch teaching team of Shandong University of Finance; In Sept. 2010 “The Course of College Computer Basis” and “A Guide for Study and Practice of the College Computer Basis Course” (A National 11th Five-Year Planning Textbook) were already published by Tsinghua University Press.

I. The Scientific Research Has Been Further Promoted

The achievements in scientific research undertaken by the teaching and experimental base (the Computer Information and Engineering School) ranked the first in the college’s 2009 scientific research quantization ranking. Of the 17 scientific research projects we have done 2 are at national level and 6 at provincial and ministerial level. Among the 4 educational reform projects one is at provincial and ministerial level. We have published 78 papers and achieved 3 scientific research awards of which is above provincial and ministerial level. We have also compiled 4 textbooks.

The finished and approved achievements in scientific research are as follows: In Dec. 2009 we accomplished the research of the State Natural Science Foundation “A Study on Emergent Driving Virtual Organization Building Method Towards Emergent Linkage Operation”. Listed in Specialized Study Projects About Humanities and Social Sciences of the Educational Ministry, “A Study on the Formation of Network Violence and Countermeasures” was approved as the research project in Nov. 2009 and so were “A Study on the Influence of Modern Network on Youngsters’ Thoughts and Morals and the Countermeasures” and “A Study on the Dissemination of Marxism Based on the New Media Technology”. Listed in projects of the Educational Ministry Returnee Foundation, “The Influence of Software Dynamic update on Performance and Its Control Method” has also been approved.

J. Contributed to Shandong Provincial Informatization Construction and Social Talenst Cultivation

We have contributed to Shandong provincial informatization construction and social talent cultivation. Under the pre-conditions of accomplishing teaching and experimenting tasks we make full use of the existing teaching resources, technological advantages and available facilities to contribute to the society. We have scientific cooperation with the enterprises like IBM, SAP, Microsoft and Inspur and through various crosswise and lengthwise project researching we promote the transformation of scientific and technological results and offer

services to the social informatization. Meanwhile the experimental base offers to train hundreds of people every year in their computer application capacities for departments of finance and taxation at different levels, and bears the testing work of the national computer grade examinations so as to effectively promote computer application levels. Our labs are open wider to the outside and ability to serve the society is obviously enhanced.

4. Conclusion

Through many years of construction our IT practical teaching base has made some achievements but it still needs to sum up more experiences. As an important component of computer technology teaching system IT practical teaching has become a hotspot in teaching links. It is the main contents that educators should consider how to cultivate students' innovative consciousness, practical operation techniques and capacities of analyzing and solving problems. Therefore it still requires us to take more efforts to promote project construction and enhance teaching resources sharing level. In future we will further strengthen the construction of the computer practical teaching labs so that the IT practical base can play an even more important role in terms of experimental teaching, educational reform, scientific research and social services.

References

- [1] Wang Zhiying, Research on Practical Teaching System and Criterion in Computer Science and Technology Major, China University Education, 2009.2(in Chinese)
- [2] Wu Dingyi, Gao Dali, Research and Practice on 21st Century Comprehensive Digital Teaching Environment, [J] Audio-Visual Instruction Research, 2004(in Chinese)
- [3] Wang Zhuli, Ye Meihong, Study on the Construction of Campus Network Teaching Resources, [J] China Higher Medical Education, 2004(in Chinese)
- [4] Wang Luhai, etc. A Primary Probe to the Application Talent Cultivation Mode with Enterprises, Journal of Xi'an Univeristy of Post and Telecom, 2007.7(in Chinese)