

Study on Teaching Reform of Basics of Computer Courses in Applied Universities in the Context of the Internet

—Taking Wuhan Business University as an example

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Abstract—In view of the teaching of basics of computer courses in applied universities in the context of the Internet, we analyze the necessity of course setting, the rationality of teaching in separate majors or classes and the cultivation of practical ability. Combining reform experiments in recent years, a program of "1+1" was adopted for the curriculum setting. We improve the teaching effect by strengthening the organic convergence of national examinations and teaching, implementing the "teaching, learning and doing" integration in class, using a variety of teaching resources and supplementing related competition activities in student organization under class.

Keywords—Internet, applied universities, computer basics, teaching reform

I. INTRODUCTION

Under the guidance of the Ministry of Education, University (College) of Applied Technology Alliance was initiated by local universities and colleges and other institutes with the type of applied technology universities as its orientation. As of October 2016, the alliance has 154 universities and colleges with full membership [1]. As a member of the University of Applied Technology Alliance, we are committed to the cultivation of technology application talents, and offer service to localities and industries as well as

promote close cooperation with industries and enterprises, providing talent training and technical service support for enterprises. The university's basics of computer courses are public basic courses, focusing on cultivating non-computer major students to use computers to solve problems of future work, study and life. It mainly cultivates students' information collection and processing abilities when using computer technology. There are more ways to acquire knowledge in the context of the Internet. Researches on the teaching reform of basics of computer courses in applied universities seem to be more important.

II. STATUS QUO OF BASICS OF COLLEGE COMPUTER COURSES TEACHING

In the era of information, computers are one of the means to adapt to the society for non-IT students. The combination of IT skills and their own specialties can enhance the comprehensive practical ability. Searching the CNKI through the keyword "Basics of college computer plus teaching", the following quantitative visualization analysis - the overall trend analysis of search results (Fig. 1) is obtained. This shows that over the past two decades, researches of basics of college computer teaching have attracted the attention from many teachers.

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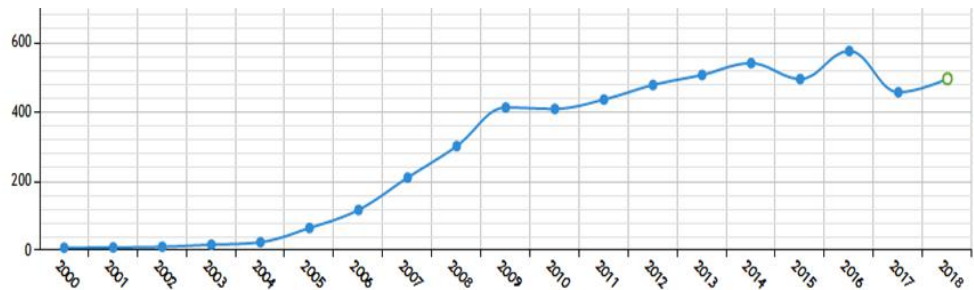


Fig. 1. Published annual trends in released volume (articles)

From the major research trends of basic and applied research, engineering technology, and higher education, etc. (Fig. 2), we can see that the level of higher education research has also seen a more than double increase in the decade. With

the increase of the enrollment of universities and colleges, the expansion of subject coverage, the basics differences in student enrollment, and the status quo of basics of college computer courses teaching have been paid attention.

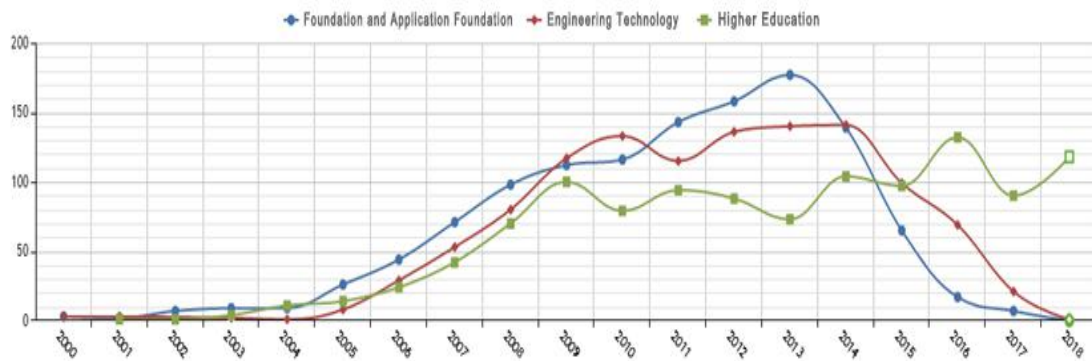


Fig. 2. Trends of research levels in published volume (articles)

A. The necessity of basic computer course setting

For some universities and colleges, especially some key ones have canceled the basics of college computer courses, but through computer applications in other curriculum to force or guide students to complete the setting objectives of basics of computer courses. As a member of the University (College) of

Applied Technology Alliance, our institute has also been considering the necessity for the setting of basics of college computer courses, but we test the condition through the computer rank examination simulation training software before the setting of the curriculum for students who entered the college in 2014.

TABLE I. SCORE PARTITION STATISTICS

| Score section | Student number | Percentage |
|---------------|----------------|------------|
| ≥ 90 | 1 | 0.13% |
| 80-89 | 5 | 0.63% |
| 70-79 | 17 | 2.15% |
| 60-69 | 56 | 7.10% |
| 50-60 | 98 | 12.42% |
| 40-50 | 197 | 24.97% |
| 30-40 | 172 | 21.80% |
| 20-30 | 139 | 17.62% |
| 10~20 | 48 | 6.08% |
| <10 | 56 | 7.10% |
| Sum up | 789 | 100.00% |

It can be seen that aside from the fundamental differences of students' birthplaces, the University (College) of Applied Technology Alliance members must also strengthen the teaching of basics of computer courses in universities.

B. Rationality of teaching in separate majors or classes

We continuously tracked the test results before opening classes with separate majors of students who entered the institute in 2014 and 2015. The results are shown in Fig. 3 and Fig. 4 as follows:

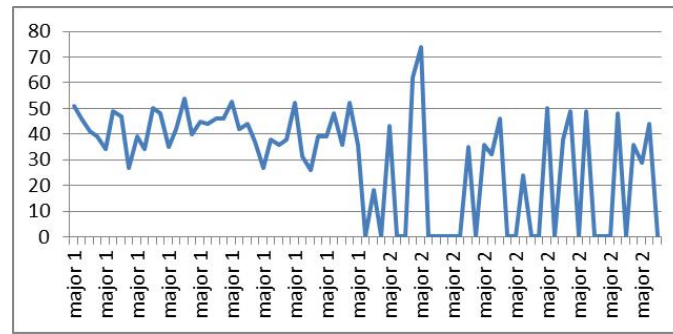


Fig. 3. Partial majors touchdown test before classes of 15th grade

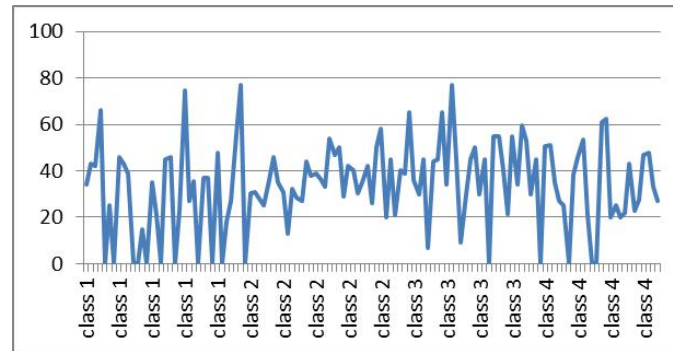


Fig. 4. Separate classes touchdown test before classes

It shows that the degree of differences in the computer skills among students in various majors is universal, and the existing teaching of different majors or classes is reasonable to some extent, and it is the most pertinent to the overall level of professional students.

C. Emphasizing the cultivation of practical ability

In 2003, the Provincial Education Examination Institute approved Wuhan Commercial Service College (predecessor of Wuhan Business School) as a computer grade examination test center. In the 12 years of the test, the center has organized computer rank examinations for a total of 30,000 or more people. With an average of 3,000 examinees per year, the passing rate of all examinees is 60%. Among them, the number of college students attending the computer rank examination accounted for 99.8% of our total number of college students; the average pass rate of the five examinations from March 2011 to March 2013 was 76.88%; and the average pass rate of the three examinations from September 2013 to September 2014 was 45.68%. However, only one person participated and passed the Grade Two computer examination in the 1351 undergraduates in our school. Looking back at the history and results of computer grade examinations in these schools over the years, we objectively reflect that in all kinds of universities and colleges, and basics of university computer courses are public basics courses based on practicality. We must strengthen the cultivation of practical hands-on abilities and endeavor to help students achieve higher level of practical computer application. In this way, students' competitive position in the future work will improve.

III. THINKING AND PRACTICE OF BASICS OF COMPUTER COURSES TEACHING IN UNIVERSITIES

Taking into account the diversity of students in terms of majors, geography and learning basics, as well as the different needs of computer knowledge, ability and quality, the unified basics of university computer curriculum has not been adapted to the needs of the situation development [2] [3]. In addition, the teaching of basics of computer courses in applied universities in the context of the Internet should emphasize the integration of teaching and make full use of the existing network resources. We have adopted the following concrete measures in the teaching reform of basics of computer courses in universities [4].

A. Differentiation program of teaching content among different majors

The course setting adopts the "1+1" plan, namely basics of university computer course plus our recommendation of a basic course of general knowledge in computer science. The specific plan is as follows:

(1) The basics of university computer course is a compulsory course in the general education platform in the program of the professional talents training in our school. Students must obtain the credit of the course. First of all, we must consider the current differentiation among students; furthermore, we should make full use of the existing network resources in the teaching reform of basics of computer courses in applied universities under the background of the Internet. Therefore, the teaching reform of basics of computer courses in our university in recent years has went through programs like 72 hours (18 weeks), 64 hours (16 weeks), 32 hours (16 weeks) and the current 24 hours (16 weeks). The teaching

hours of integrated teaching have been substantially reduced. The school has increased support for the teaching reform of the university's basics of computer courses, given priority to the setting of quality resources sharing classes, and meticulously organized teachers to participate in the related construction of micro-curricular and teaching materials.

At the same time, the course implements the exemption system and students can participate in the basics of university computer exemption exam that uniformly organized by the school. Qualified students are exempted and receive credit of the course. Students who have obtained a certificate of the National Computer Rank Examination Grade 1 or above and

those who have obtained a certificate in Computer Technology and Software Professional Qualification (Level) Examination or above may not take the exemption exam and receive the course credit directly.

(2) After completing basics of university computer courses, it is recommended that all majors follow the talents training objectives and specifications, and choose a course as the general required course of professional computer science from the courses like "basics of computer programming", "multimedia technology and applications" and "database technology and applications" (Table 2).

TABLE II. RECOMMENDED COURSES FOR EVERY MAJOR

| Categories | Majors | Recommended courses |
|---------------------------------------|---|--|
| Majors about Economics and management | E-commerce, logistics management, international business, financial management, hotel management, tourism management, sports economics and management, auditing, economics and finance, etc. | Basics of computer programming design, database technology and applications, basics of webpage design and website construction |
| Majors about science and engineering | Culinary and nutrition education, food quality and safety, automotive service engineering, robotics engineering, vehicle engineering, building environment and energy application engineering | Basics of computer programming design, database technology and applications |
| Majors about cultural education | Business English, translation, etc. | Multimedia courseware production, database technology and applications |
| Majors about arts | Animation, clothing and apparel design | Basics of computer programming design, multimedia technology and applications |

Credits, hours and some other issues of the selected courses are individually set according to the professional requirements for course contents.

(3) The setting of basics of university computer interest classes with the form of general selective or public selective courses is mainly for students who need to further improve their computer application skills. It is used to enhance students' ability of single OFFICE function and promote understanding of commonly used application software such as MATLAB to further broaden students' knowledge scope.

B. Strengthen the organic linking between national examinations and teaching

Through the national examinations, we are more easily to unify teaching objectives, assess students' knowledge level more comprehensively, and are more conducive to strengthening the construction of the teaching staffs. Furthermore, we are able to accumulate teaching cases and improve the teaching level. The national examinations have a significant role in promoting the teaching of basics of university computer courses. Meanwhile, the scores of national examinations can reflect the actual level of a student's computer skills more fair and objectively, and they also provide a strong basis for students' exemption courses.

1) National Computer Rank Examination supplements student course assessments

From students of level 2009, the basics of university computer assessment of our school was changed to the combination of the usual scores and the National Computer Rank Examination Grade 1 test scores. The usual scores and the rank exam scores account for 40% and 60% respectively of

the total scores. The usual grades consist of student attendance, assignments, on boarding etc.

2) Computer Technology and Software Professional Qualification (Level) Examination builds a bridge between students' academics and employment

Computer Technology and Software Professional Qualification (Level) Examination (hereinafter referred to as "Soft Examination") is co-led by the Ministry of National Human Resources and Social Security, Ministry of Industrialization and informatization. In order to better develop the computer informatization industry in China and improve the related treatment of senior personnel, the Ministry of National Human Resources and Social Security formally issued the Interim Provisions for the Examination of Computer Technology and Software Professional Qualification (Level) in 2003. Since then, China will no longer carry out title evaluation of the computer industry, and their qualifications will all be passed through the national soft exam. Participating in any exam level simultaneously is not subject to professional, academics, qualifications, and occupational conditions, and it is the only exam that is accepted by other countries in all professional examination fields.

Students who have learned basics/introduction of computer and Office applications in various majors can at least take part in occupation information processing technician exams, and can be employed by Internet operators, big data analysts, engineering data administrators, configuration staffs, database administrators and so forth. With strong pertinence, it can serve as an important reference for talents selection by employing units. It can also eliminate the shortcomings of the undergraduates with only a single professional graduation

certificate, and it is also a reflection of the actual and effective convergence of the university's knowledge with the society.

C. Improvement of teaching models and methods

1) "Teaching, learning and doing" integrated teaching model in class

Due to the substantial reduction in class time, most schools adopt the "teaching, learning and teaching" integrated teaching model to improve the effectiveness of classroom teaching. The teaching mainly adopts the operation task-driven teaching method and the case teaching method with the heuristic teaching method and the analogical French teaching method assisting students in broadening the learning content, especially the learning of new knowledge points. In the teaching, we highlight the commonly used software windows and the use of the fine methods so that students can make inferences by analogy. In this way, students are able to memorize better the important points of the teaching and can use the same reasoning.

2) Using multiple teaching resources after class

Most of the current classes of undergraduate teaching are conducted through the school's excellent resources sharing class, MOOC and micro-curriculum resources, guiding students to make use of their spare time. At the same time, the school also strongly supports the construction of network resources of basic courses.

The school library is more multi-directional. It introduces computer technology-related curriculum resources from multiple angles and supports teachers (especially students) to study independently with learning targets for improving their computer application abilities. With the help of the IT online education platform launched by the similar 51CTO (Chief Technology Officer) Institute [5], we create a three-in-one network education characteristics of IT training, excellent network technology training courses, training self-test questions, and we promote the upgrading of modern information technology and computer applications among undergraduates.

3) Supplementing related students' association activities

In the era of information, computers are one of the means to adapt to society for non-IT major students. The combination of IT skills and their own specialties can enhance the comprehensive practical abilities. Combining the learning

characteristics of the student's period, we have organized computer-related capacity demonstrations and competitions in order to promote interest in basics of university computer courses. In this way, it can also promote students' computer application capabilities. For examples, we can achieve it through the OFFICE special ability competition organized by the student community organization, level demonstration of animation and graphics analysis combining with the professional computer capabilities. Meanwhile, the school grants certain practical activity credits to students participating in similar activities, and encourages their time and opportunity costs spending on the study.

IV. CONCLUSION

After continuous trials in recent years, classes and learning hours of basics of university computer courses have been greatly reduced, and students' test scores have been greatly improved. With the revolution and transformation, education confronts with severe challenges on the one hand and opportunities for development and innovation on the other hand. About cultivating talents with comprehensive quality for the society, the first line of teaching workers must not only innovate in the teaching and training concepts, but also improve and promote the organic combination of teaching and certificates in the actual work. Knowledge scope of basics of university computer curriculum is broad, and at the same time it emphasizes hands-on practical ability. The exploration of its teaching method is a long-term process that needs continuous improvement. We will make unremitting efforts to strive to do a good job so that more students can learn well and apply knowledge to the actual use.

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