System Building & Practice Extension of Basic Computer Teaching in the Higher Agricultural Colleges

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Abstract. Basic computer teaching is a series of basic and compulsory courses. In the higher agricultural colleges, Computer Basis and Programming Design are the basic courses. The former is aimed to train the operation ability, the latter is aimed to make the students build the computational thinking and write the program code, and own the computer ability, apply the ability to the major domain. The paper introduce the several impacts of system building and extension, including courses building, teaching material building, teaching model building, item bank building, computational thinking train and innovation ability train.

Introduction

At present, computer has embedded into every aspect of social life, and people communicate with computer all the time. Computer plays a huge role in the life and science research. In the agricultural colleges, every major has the close relation with the computer, including data processing, numerical calculation and computer simulation etc. Therefore, it is an important problem to determine a reasonable teaching objective. Is it satisfied only to pass the final exam and get the credits? Does it only learn the book knowledge? Or is it a sublimation of knowledge? Every college explores the problem and gains some success, but still has some deficiencies.

Every student has own different situation and aim, so we should build different teaching aim to satisfy them. And base on the different ability,

The Contents of System Building & Practice Extension

Computer basic teaching is responsible of popularizing computer basic knowledge, training ability of computational thinking and improving the practice ability. Based on the computer teaching plan, we regard “University Computer Basis” and “High Level Language Programming” as research courses, build the multi-layer training model that adapts higher agricultural college students. We divide the students into three levels, the first level is that can master the knowledge of the two courses, pass the final exam and get the credits, master the basic computer technique; the second level is that can pass NCRE and get the certificate, process major problem; the third level is that learn spare capacity, participate the college students’ innovative entrepreneurial activity, computer competition and get good grade, own higher computer level, become the innovative talents in the information age. It shows in Figure 1.

In order to realize the aim, we adapt the following methods.

Write and Revise the Corresponding Teaching Plan and Experiment Plan, Make it Adapt the First Level Students. We based on the office of teaching affairs rule, formulated reasonable teaching period and teaching material, In the “University Computer Basis”, we teaches the computer theory knowledge and operation about operation system and office, trained the operation abilities of students; in the “High Level Language Programming”, we teaches basic syntax rules, program control statements, controls and all kinds of database operation, make them master basic program
design methods, cultivate the computational thinking, formulate the thinking mode of computer and design some simple programs.

![Multi-Layer Training Model](image)

In the same time, we pay attention to the check of the usual learning, except homework and lab report, we emphasis the communication with students each other in the classroom, improve the active, cultivate the interest and hobby.

Through the above methods, most of students can pass the final exam and get the credits, ensure the courses teach, make good effects.

**Cultivate the Autonomous Learning Ability, Solve the Unknown Question Ability.** In the classroom, the teachers point out the important and difficult, teach the learning methods; after class, they communicate with students with network chat tools, arrange some extra homework to train them, cultivate autonomous learning ability. For example, we arrange them to learn Java or .NET, extend the knowledge. When passed a period, they can form the habit and the ability, cultivate practice ability and computational thinking and enhance the confidence and learning interest.

**Cultivate Competition Ability, Improve the Paper Writing Ability Based on the Innovation & Entrepreneurship Activity and Computer Competition.** There are many platforms in the schools and socials, the students can afford to show themselves on it. Under the guidance of the teachers, combined with their own major, they can design the CAI, and develop the relative programs about their majors. Through the activities, the students improve the computer levels, extend the scope of computer knowledge, make themselves better exercise. They can get better materials for writing papers. They can write papers and publish the paper in the different level journal, some of them were indexed EI or ISTP.

**Write High Level Teaching Material.** We write “*University Computer Basis*” and “*High Level Language Programming*”, they were listed as 12th Five-Plan in the Chinese Agricultural Press. The content is rich and detailed, Attaches great importance to combine theory and practice. Aimed to improve the quality and computer level of the students, the teaching material content is new, and linked closely the computer development trend. In the teaching process, it welcomes by the students.

**Build Three-Dimensional Teaching Mode, Perfect the Auxiliary Teaching Resources.** In order to solve the in-class and after-class, accelerate the three-dimensional teaching, we build the
corresponding resources based on the MOOCs platform of the school. We use the net sources in the school, build the net teaching platform, including teaching program, teaching plan, exercise & answer, laboratory procedure, unit testing etc. We also provide teaching pictures, videos and animations, the resources are free to all the students. The website often updates the details. With the support of perfect network, we encourage students to autonomous learn, extend the scale of knowledge, apply the knowledge to practice, master it deeply.

We introduce the test system, realize exam based on computer. The exam focuses on the combination of theory and practice and attains good effects.

**Item Bank Building.** The testing system supports multi-user operation, every user can operate the database in the user permissions. Most of test questions are from our own teachers, adapt the demand of our own school, and it plays an important roles.

**The Effects of System Building & Practice Extension**

Through applying the above methods and means, we have attained a lot of achievements. The teachers improve the teaching level and science research level, the students exercise themselves.

**Attend Computer Competition, Train the Practical Ability of Students.** Through autonomous learning, the students extend their knowledge scale, they can solve some actual problems with their majors. In the competition, they also can find some new problems, learning and competition are Complement each other. They can apply what they have learned to the practice, so it can increase their interest.

**Improve the Teachers’ Teaching & Research Level.** The students meet lots of problems during their autonomous learning and competition, they need to seek to help from their teachers. But perhaps some of problems appeared in front of the teachers first time, so the teachers also study the problems. Therefore, many teachers learn much knowledge, study deeply some problems. It improves their knowledge level, promotes their teaching and science research levels.

**Improve Team Cooperation.** In the training period, everyone may meet all kinds of problems, but they don’t solve all of them, so they need to seek that can solve the problems. Gradually, they combined a team, everyone is responsible for some of aspects, form a good atmosphere of cooperation.

**Conclusion**

Computer basic teaching is the foundation of science research. We should build a different level training model aimed to different students’ demand. In the process, how to formulate a accurate plan to fit the demand is an important subject. In the paper, we are just listed our approach, hope to be able to help you.

**References**