



Research and design of course experiment system based on cloud platform taking "the advanced application of office software" as an example

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taking “the advanced application of office software” as an example

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## I. INTRODUCTION

*Abstract—In the light of the education information process, the students' learning effect and the innovation of the teaching mode are studied and analyzed. Taking the course of "high application of office software" as an example, the course of this course is usually used only in the examination system, and is used in the local area network environment, the experiment system is serious and the use is inconvenient. This paper expounds the use of cloud computing platform in campus, combined with iStudy experiment system to promote active learning. Using the characteristics of the cloud platform, it combines the best features of online learning with the traditional classroom learning, and applies it to the redesign of the "high application of office software" in the redesign of the classroom model, to carry out a full range of support teaching, further deepen the ability of the students to operate the office software, and the teachers and students can use the system anytime and anywhere. The use of course teaching shows that students' learning enthusiasm and examination results are better, and learners interact with other learners more.*

**Index Terms**—cloud computing; teaching experiment system; office software advanced application; iStudy

"The advanced application of office software" is a course to further improve the application ability of the computer after the basic computer study of the non-computer major. This course is designed on the basis of knowledge module and practical operation on the content design, focusing on the teaching purpose of training applied talents in Colleges and universities. With the development of technology, cloud computing technology has provided a new way of thinking for the deployment of teaching system because of its advantages of server integration, online migration, isolation, flexible deployment, low management cost and so on<sup>[1]</sup>. From MOOC to SPOC, the promotion of educational informatization is affecting all aspects of education and teaching <sup>[2][3]</sup>. Educators and other stakeholders are more and more needed to explore the use of different media to help students build "everyone can learn, learn and learn at all times". By drawing on the development plan of education information, the teaching system is explored to integrate the teaching model of "office software advanced application" to provide an efficient classroom for learners to improve the learning efficiency and accuracy of learning ability.

## II. DEEP TEACHING MODE IN CAMPUS

The ministry of education has expanded the scale of the university education, and more and more students enter the university every year. As an example, more than 5000 of the students in the computer public class are studying every year. How to fully guide every student to become a huge workload? In order to solve the above problems, the designed curriculum experiment system uses cloud computing technology to break the limits of time and space, and can basically pay attention to the students' learning situation in real time in 7\*24 hours. As a course experiment system under the cloud computing platform, teachers and students can access and obtain high quality teaching resources at any time. At the same time, cloud computing can provide a more appropriate framework for the operation of the course experiment system. It can effectively reduce the difficulty of development and maintenance of the platform and the overall IT cost, and ensure the security and stability of the platform. A large amount of manpower and capital investment. Basically establish an all-weather of virtual classroom teaching practice [4]. The cloud computing design framework is shown in Figure 1. The system is divided into contents. Under current technology support, there are two kinds of teaching modes that integrate advanced application of office software.

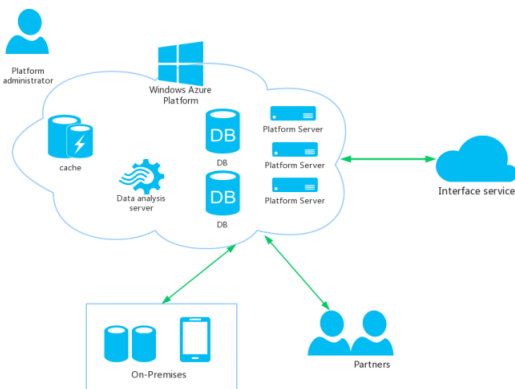


Fig1. Cloud computing design framework.

### A. Online model of classroom teaching.

With the help of the system's resource construction module, automatic marking module, micro lesson module and station letter module, it can interact in time. The storage capacity of the system is small, which is compatible with the current mainstream operation system, and is easy to operate. Because of the students' individual differences, this system can automatically implement stratified teaching in the course teaching, and build a deep teaching model [5] suitable for different levels of students, such as Figure 2.

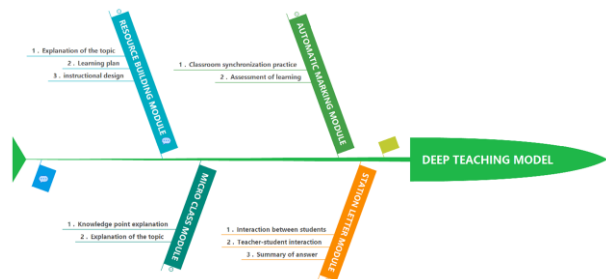


Fig 2. Flow chart of deep teaching mode.

### B. Extracurricular teaching off-line mode.

The system pays attention to the teaching process and accords with the conditions of "everyone learning, learning everywhere and learning all the time". The system supports students in extracurricular time, and achieves the same effect as online class. All modules can be used in the non-teaching time. The automatic reading module and the micro class module will record the students' learning situation. It is helpful for the teaching to master the students' learning progress in real time. The station letter module keeps the interaction between students and teachers, and the process of knowledge acquisition is also recorded. This way, it is convenient for teachers and other educators to do research on students' learning situation.

### III. THE TEACHING OF "HIGH APPLICATION OF OFFICE SOFTWARE"

At the present stage, the course teaching on the advanced application of office software on the domestic teaching platform is almost limited to the national computer grade examination "two level MS Office advanced application", and the curriculum study syllabus is fixed. Not really combining the actual situation of their own school students to design scientific learning content and methods, often pay attention to how much content, not how much the content of the students, in real life, how to use Office high efficiency and high quality to solve the problem. The teaching experiment platform proposed in this paper can combine the actual situation of the students of their own school, adjust the depth of the learning content, make the students get full and comprehensive development, and apply the skills to the actual life.

The course experiment system proposed in this paper supports the teaching of WPS and Microsoft office software Word, Excel, PowerPoint, Outlook and Access and so on. From the technical level of the system, it has flexible timing function and independent theme module. Curriculum management, exam proposition and subject mechanism of automatic marking technology of robustness and stronger scalability. Therefore, it is easy to provide rich

resource types, such as courseware, teaching case, study case, material, video and test paper in the course teaching of "high application of office software", which is favored by teaching designers.

#### A. course example -- Word experiment.

The course experiment system is equipped with ten sets of Word individual operations as teaching cases, which can be used as a reference for educators. These teaching resources reflect the special functions of the system. In the process of building the resource of the question bank, the teaching outline of the MOOC platform in the mainstream colleges and universities, the survey of the computer technical training curriculum in the social related functional departments and the colleges and universities which use the course experiment system have designed the reasonable teaching catalogues of the middle school students' learning. The Word has been deepened and the students can fully apply the skills they have learned to work after their entry, such as the conversion between Word and the CorelDRAW software of the Graphic design software., and the two editing of [6]. Through the tutorial system, I find that with the deepening of knowledge, students' interest in learning has not weakened. The deepening structure of the knowledge point is shown in Figure3.

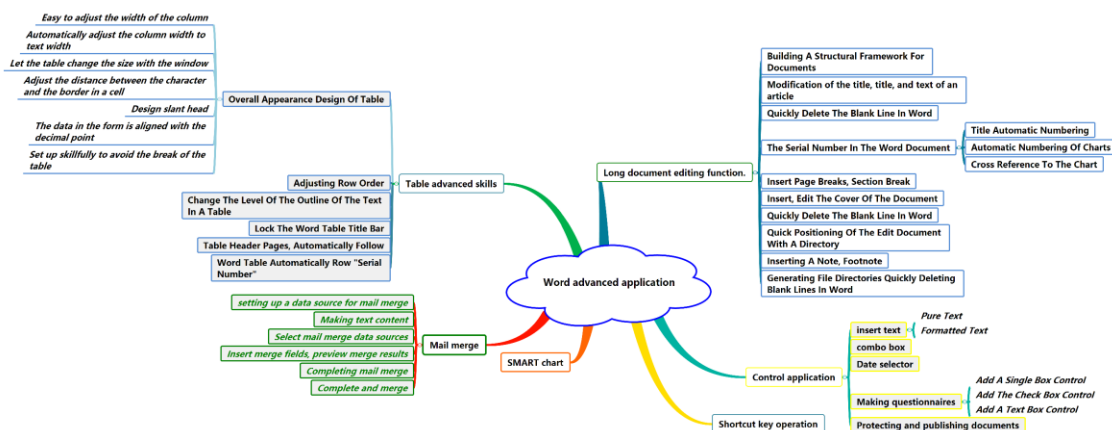


Fig 3. advanced structure chart of Word advanced application.

The form of Word is more detailed for the appearance design of the form, and gets a more beautiful form. In particular, we use domain code to sort values of cells. Through this knowledge point, students do not have to calculate and sort in Excel in the future, and then copy them into Word, but operate directly in Word, and improve the operating speed of office software. course system is more robust for the design of knowledge points, and can accurately locate each cell, including the application of form to format. The system has added SMART chart and self-selected graphic design teaching, especially to deepen the explanation of the design of thinking block diagram. It is

convenient for students to apply [7] to future literature or technical document work.

### B. Teaching example -- Excel experiment.

The system is more practical in the teaching of Excel. MOOC platform by comparing different colleges teaching outline, with reference to the enterprise functions of the computer training courses, and connecting with the campus students Excel learning situation in recent years, the formula and function, data management and analysis, charts, handling, and deepening [8], VBA controls have been carried through macro program positioning data and extract the [9], as shown in figure 4.

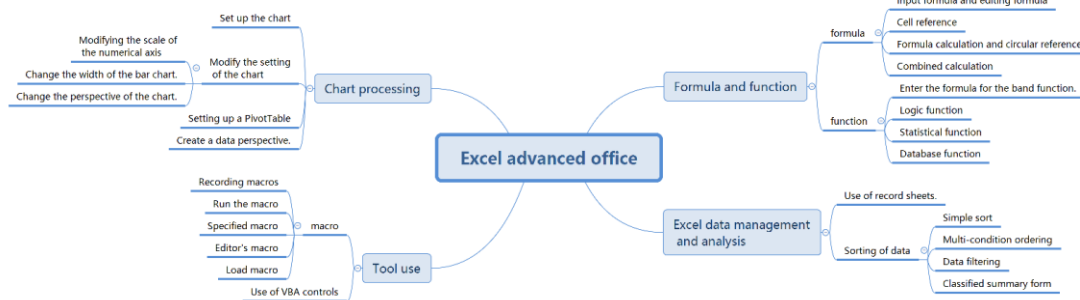


Fig 4. advanced structure diagram of Excel advanced application.

In the chart style, we can accurately locate the specific functions of [10], such as the font,

legend and simulation table of a chart, as shown in Figure 5.

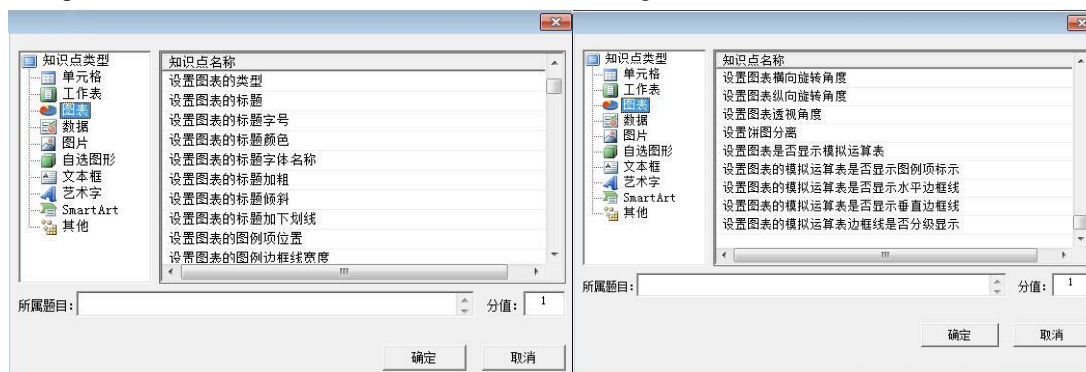


Fig 5. resource construction module, Excel chart, characteristic knowledge points.

From figure 5, we can see that the system can accurately locate certain knowledge points and enhance students' learning. Take the knowledge point of analog operation table, it is a special function of Excel2010 and updated version, which is used for prediction analysis. By comparing the changes of one or

more data variables, we calculate the impact on prediction variables. Using this function flexibly helps to deepen students' understanding of Computational Thinking [11]. Of course, this system also provides data sorting, filtering and learning functions of VBA controls.

#### IV. The functional structure of the course experiment system

In order to support the above functional requirements, the curriculum experiment system is designed by using the large-scale system module shown in Figure 3.1. The system

contains six main functions. (1) system management; (2) item bank management; (3) teaching management; (4) examination management; (5) expert review; (6) personal center. The system architecture, as shown in Figure 6, is designed.

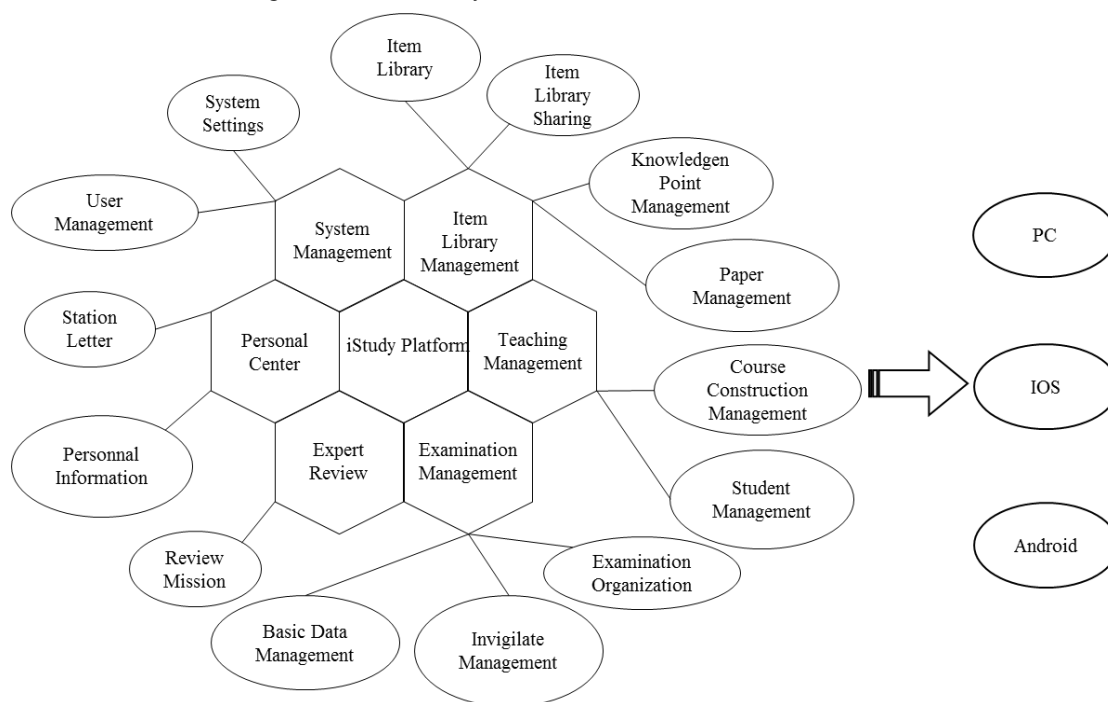


Fig 6. The Platform Architecture of iStudy

#### V. The overall design and advantages of the course experiment system

In order to adapt to "the advanced application of office software", meet the requirements of teaching at anytime and anywhere, complete the requirements of online design course content, after-school work, simulation practice, automatic review, boarding examination and so on. This paper presents a curriculum experiment system, iStudy, whose overall design is illustrated in Figure 7. The iStudy cloud platform provides multiple types of instances, operating systems and software packages. In view of the different needs in teaching activities, CPU, memory, hard disk and bandwidth can be flexibly adjusted to meet the resource needs of application resources inside the platform. iStudy includes multiple webpage versions, IOS versions and Windows

versions. At the same time, teaching resources package is provided for selection.

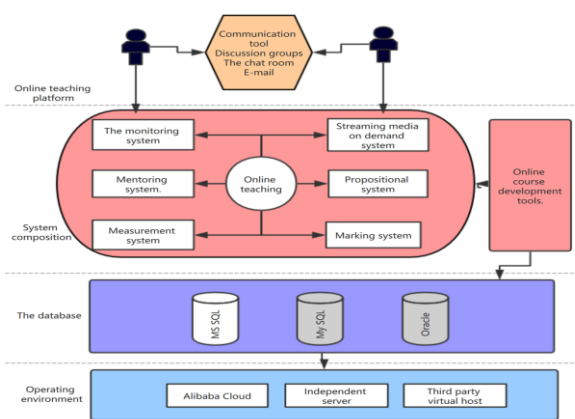


Fig 7. The overall design of the online course platform

The core functions of iStudy cloud platform are after-class homework, classroom experiment, learning materials, online video, computer training, network examination, test management and question bank management. There are

intelligent marking technology, flexible and varied assessment mode, open question bank propositional mechanism, multi-position group volume strategy, functional examination and curriculum management system. The platform realizes the unification of teaching and evaluation, solves the problem of teacher's work, and provides strong support for teaching management. In this paper, a variety of test is realized, which solves the problem of teacher's problem and complicated group. It realizes the online whole-process evaluation and intelligent feedback, and solves the problem that students can't get timely feedback from teachers when they study autonomously. It has realized the construction of course platform in the cloud environment and saved a lot of manpower and capital investment. The platform supports traditional network teaching, mixed mode teaching and MOOC teaching multi-directional teaching mode, extending the classroom from time and space dimensions, and can effectively support students' autonomous learning ability.

## VI. CONCLUSION

In this paper, a course experiment system based on cloud computing is put forward. Taking the course of "high application of office software" as an example, the content of the course experiment is designed, and the teaching process and teaching system are instantiated. Combined with the key problems in the traditional teaching process, it provides teachers, students and administrators with a comprehensive teaching environment of teaching, learning and management in three aspects. Finally, it introduces the campus oriented deep learning model iStudy, which is based on cloud computing technology, which provides technical support for resource sharing and inter temporal interaction between teachers and students. The teaching experiment proves that the iStudy course experiment system has advanced teaching methods and means in the

advanced application of office software, and has a great advantage in the teaching of the campus.

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