Computer Life (CPL) ISSN: 1819-4818
DELIVERING QUALITY SCIENCE TO THE WORLD

Teaching based on Cases for Python Course

Xuewen Shen

College of Media Engineering, Communication University of Zhejiang, Hangzhou, China

cuzmath@126.com

Abstract: In this paper, we talk about the teaching method for Python course. We include many suitable cases study for the curriculum experiment. Based on the interactive form of online and offline teaching, we cultivate student's subject integration and practical ability.
Keywords: Python, Case, Curriculum, Reform.

---

1. CURRENT SITUATION OF CURRICULUM CONSTRUCTION

With the rise of artificial intelligence and big data, the importance of linear algebra as the mathematical basis of calculation has become increasingly prominent. The integration of theoretical knowledge and related professional knowledge and the application of computer to solve practical problems are more and more widely used. However, in the current reform of basic mathematics curriculum construction, the traditional one-way teaching mode has gradually changed to the two-way mode.

But in the specific practice of students, that is, practice and practical application, it is only limited to the exercise of knowledge after the book, and there is no connection between it and practical application. The form of completion is also paper-based or similar to paper-based homework, which is rarely combined with the application of computer. However, in reality, the application and analysis of linear algebra knowledge cannot do without the assistance of computer Help application [1].

Based on the above needs and the current situation of classroom teaching reform, at the same time, on the basis of the previous teaching reform, the host of the project completed the reconstruction of theoretical knowledge of the teaching content of Python [2], as well as the recording and production of courseware and video of theoretical knowledge, which provided a certain basis for the follow-up teaching reform of online autonomous learning before and after class [3]. On the basis of the interactive form of online and offline two-way teaching, with the help of computer operation platform to mobilize students' hands-on ability, to cultivate students' subject integration and practical ability.

2. CONSTRUCTION IMPLEMENTATION PLAN

The design of the scheme (including the concept of curriculum reform, the goal of curriculum reform, the content of curriculum reform, and the methods of curriculum reform, which must be operable)

2.1 The concept of curriculum reform

Based on the concept of "new engineering" classroom teaching, the traditional teaching mode should be changed, that is, from the teacher-centered teaching mode to the teacher-student two-way main body teaching mode, so as to realize the "decentralization" of the classroom and realize the classroom teaching of multi-disciplinary integration. Based on this, in the classroom teaching reform of linear algebra, we should grasp the integration of computer science and professional subjects to reconstruct the teaching content. The first is to make students' thinking move and consider how to introduce the case of integrating professional knowledge through teaching design, so that the subject knowledge is around and applied in the "grounded atmosphere" life scene, so as to better improve the students' personality, thinking and wisdom level; The second is to make students understand and apply the best knowledge in the process of understanding and applying the knowledge.

2.2 The goal of curriculum reform

From the online and offline two-way interactive teaching form of classroom teaching, and the construction of cases combined with professional knowledge, with the help of computer operation platform to realize the application and mastery of knowledge. Cultivate the students' practical ability and the ability to solve practical problems by applying knowledge.

2.3 The method of curriculum reform

The teaching content is divided into theoretical knowledge and applied case knowledge, corresponding to the construction of these two parts. Python teaching content, in order to realize the application teaching of knowledge while mastering theoretical knowledge on the platform. Finally, it can construct the teaching content of the organic integration of basic knowledge and professional knowledge of linear algebra; The method of curriculum reform: using Python software to master the knowledge of linear algebra with the help of jupyter platform.

3. IMPLEMENTATION STEPS

The project will be conducted in the experimental class and will need to be taught in the laboratory. The content of the project is divided into two parts: the first part is the application of theoretical knowledge, which mainly includes the explanation of theoretical knowledge and the application and operation practice of theoretical knowledge on the platform; the second part is the practical application link, which is mainly to construct practical cases and group them into application and implementation on the platform.

The specific implementation process of the course teaching term consists of four parts: pre class video preview + Classroom theoretical knowledge explanation + Classroom Application Practice Learning + application interaction after class. This project is based on the basic course of linear algebra, with a total of 48 class hours. The course content distribution planning: 36 class hours of theoretical knowledge. After class exercises are divided into small exercises and large exercises. Each student needs to complete 10 small exercises and 1 large exercise. The small exercises are to be completed by individuals independently, and the large exercises are planned to be completed by 2-3 people, and the homework report is formed.

In terms of curriculum evaluation, based on the idea of process evaluation, it is divided into 5% of class listening + 20% of small exercises after class + 5% of large exercises+Mid term 20% + final 50%. The final examination form can also be realized by computer practice programming.

In the implementation of teaching methods: combined with the computer jupyter platform, the use of Python software to achieve the application of knowledge points; in classroom teaching, the combination of teaching and practice.

4. EXPECTED ACHIEVEMENTS AND PROMOTION VALUE OF CURRICULUM REFORM

Ten basic knowledge Python courseware contents are made and implemented on jupyter platform; To form 5-10 cases of large exercises to facilitate the students to practice in groups and teams, the contents of which are combined with professional application; to construct the curriculum system of jupyter platform; to form a new curriculum evaluation system; and to form a new curriculum evaluation system;

It is expected that the application and promotion effect will be carried out in two experimental classes. If the implementation effect is good, it can be further extended to the classes we teach, all the classes in the school of electronic information and new media, and some classes in the school of management, with a total of more than 700 students.

ACKNOWLEDGEMENTS

This paper was supported by Project of innovation experimental area of curriculum teaching mode in 2019: Case practice application based on Python.

REFERENCES

[1] Liu X , Xu H . School-Enterprise Cooperation on Python Data Analysis Teaching, 2019 14th International Conference on Computer Science & Education (ICCSE). IEEE, 2019.

[2] Xuejun Z , Xiaohui D . Design and Development of Project Case Resources for AI Course in Senior High School. e-Education Research, 2019.

[3] Guanghui Z , Yanjun L , Yixiao T , et al. Case-Based Teaching Organization for Python Programming that Focuses on Skill Training. 2018:1-5.