



# Research on the balance between theoretical and practical teaching in Python programming courses in higher vocational colleges in Jiangxi, China

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**ABSTRACT:** This paper aims to explore the balance between theory and practice teaching in Python programming courses in higher vocational colleges. Through the investigation of the current situation of Python programming courses in higher vocational colleges, the disconnection between theory and practice in current teaching is analyzed, and a series of teaching strategies and suggestions are put forward. The research holds that the teaching mode combining theory and practice can effectively improve students' programming ability and comprehensive quality, and provide a reference for the teaching reform of Python programming in higher vocational colleges.

**KEYWORDS:** higher vocational colleges in Jiangxi, China; Python programming; theoretical teaching; practical teaching; balanced research

## I. INTRODUCTION

In today's information society, computer programming ability has become one of the important standards for measuring the comprehensive quality of talents. Python, as an efficient and easy-to-learn programming language, has been widely used in computer education in higher vocational colleges in Jiangxi, China. However, in the teaching practice of Python programming courses, we often face the problem of how to balance theory and practical teaching.

[1]. Theoretical teaching is the foundation of Python programming courses, which provides students with solid programming knowledge and theoretical foundation. However, it is not enough to rely solely on theoretical teaching, because programming itself is a very practical skill. Practical

teaching can help students apply theoretical knowledge to actual programming and improve their hands-on skills and problem-solving abilities. Therefore, the balance between theoretical and practical teaching is crucial in Python programming courses in higher vocational colleges in Jiangxi, China.

[2]. However, in the actual teaching process, it is often found that there are certain contradictions between theoretical teaching and practical teaching. On the one hand, too much theoretical teaching may make students feel boring and difficult to stimulate their interest in learning; on the other hand, insufficient practical teaching may cause students to lack practical experience and find it difficult to truly master programming skills. Therefore, how to achieve an effective balance between theoretical and practical teaching in Python programming courses has become an urgent problem to be solved.

This article aims to explore the balance between theoretical and practical teaching in Python programming courses in higher vocational colleges in Jiangxi, China. First, we will analyze the current teaching status of Python programming courses in higher vocational colleges in Jiangxi, China, and point out the existing problems and deficiencies. We will then explore specific strategies and methods for achieving a balance between theoretical and practical teaching. It is hoped that it can provide useful reference and reference for the teaching reform of Python programming courses in higher vocational colleges in Jiangxi, China, promote the development of computer education in higher vocational colleges in Jiangxi, China, and cultivate more outstanding talents with solid programming abilities and innovative spirit.



## II. ANALYSIS OF THE CURRENT SITUATION OF PYTHON PROGRAMMING COURSES IN HIGHER VOCATIONAL COLLEGES IN JIANGXI, CHINA

i. Curriculum setting and teaching content  
[3]. The setting and teaching content of Python programming courses in higher vocational colleges in Jiangxi, China often cover many aspects such as the basic grammar of the Python language, data structures and algorithms, object-oriented programming, and Web development. The content is arranged to provide students with comprehensive and systematic knowledge of Python programming. However, in actual teaching, we find that the curriculum sometimes focuses too much on the transfer of theoretical knowledge and ignores the cultivation of practical application skills. In addition, some higher vocational colleges in Jiangxi, China, fail to keep pace with the times in terms of teaching content and fail to introduce the application of Python in emerging fields such as artificial intelligence and big data analysis in a timely manner, resulting in teaching content being out of touch with actual needs.

ii. The proportion of theoretical and practical teaching  
In Python programming courses in higher vocational colleges in Jiangxi, China, there is often an imbalance in the proportion of theoretical and practical teaching. On the one hand, some teachers place too much emphasis on theoretical teaching, resulting in students lacking opportunities for practical operations; on the other hand, the practical teaching link is often not paid enough attention, the class arrangements for practical teaching are insufficient, and the practical projects lack challenge

and practicality. This imbalance makes it difficult for students to combine theoretical knowledge with practical operations, affecting the teaching effect and students' learning experience.

iii. Student learning status and feedback  
When students in higher vocational colleges in Jiangxi, China take Python programming courses, there is a common problem that they have good theoretical knowledge but insufficient practical ability. Students can often achieve better results in theoretical study, but often encounter difficulties and challenges in practical operations. In addition, some students are not very interested in Python programming and lack the initiative and enthusiasm to learn. Through the collection and analysis of student feedback, we found that the difficulties encountered by students in practice mainly include unclear programming ideas, frequent grammatical errors, and weak debugging abilities. These problems reflect the current problems and deficiencies in the balance between theoretical and practical teaching in Python programming courses in higher vocational colleges in Jiangxi, China.

To sum up, there are some problems in the Python programming courses in higher vocational colleges in Jiangxi, China, in terms of curriculum setting, teaching content, proportion of theoretical and practical teaching, and student learning conditions. In order to solve these problems, we need to re-examine and adjust teaching models and methods to achieve an effective balance between theoretical and practical teaching.

## III. BALANCE STRATEGY BETWEEN THEORETICAL AND PRACTICAL TEACHING

i. Optimize the curriculum and rationally allocate theoretical and practical class hours  
In Python programming courses in higher vocational colleges in Jiangxi, China, optimizing course settings is the key to balancing theory and practical teaching. First of all, the teaching objectives of the course should be clarified to ensure that the course content not only contains necessary theoretical knowledge, but also focuses on the cultivation of practical skills. Secondly, according to the teaching objectives, the theoretical and practical teaching hours should be reasonably allocated. Appropriately increase the proportion of practical teaching class hours to provide students with more hands-on practice opportunities. At the same time, theoretical teaching should also maintain sufficient class hours to ensure

that students can master solid basic knowledge of programming.

ii. Strengthen practical teaching links and improve students' practical ability

[4]. Practical teaching is an important way to improve students' practical ability. In Python programming courses, practical teaching links can be strengthened through experiments, practical training, course design and other forms. The experimental session can provide special training on key and difficult points in the course to help students consolidate theoretical knowledge; the practical training session can simulate a real working environment, allowing students to learn how to use Python programming to solve practical problems in practice; the course design session can guide Students comprehensively apply the knowledge they have



learned to complete challenging projects, cultivating students' innovative ability and teamwork spirit.

- iii. Introducing project-driven teaching methods to promote the combination of theory and practice [5]. Project-driven teaching method is a teaching method that closely combines theory and practice. In Python programming courses, project-driven teaching methods can be introduced, using actual projects as a carrier, allowing students to learn and apply Python programming knowledge in the process of completing the project. This method can stimulate students' learning interest and initiative, making them more actively participate in learning. At the same time, through the implementation of the project, students can also exercise their problem-solving and teamwork skills.
- iv. Construct a diversified evaluation system to comprehensively evaluate students' abilities  
In order to comprehensively evaluate students' programming ability and comprehensive quality, a diversified evaluation system needs to be constructed. In addition to the traditional written examination and

#### IV. CONCLUSIONS AND SUGGESTIONS

##### i. Conclusion

First of all, there are indeed some problems in the balance between theoretical and practical teaching in Python programming courses in higher vocational colleges in Jiangxi, China. These problems are mainly manifested in the fact that the curriculum is too theory-oriented, the practical teaching links are insufficient, and the teaching methods are single, making it difficult for students to combine theoretical knowledge with practical operations, which affects the teaching effect.

Secondly, in order to achieve an effective balance between theoretical and practical teaching, we proposed a series of balancing strategies, including optimizing curriculum settings, strengthening practical teaching links, introducing project-driven teaching methods, and building a diversified evaluation system. These strategies aim to improve the proportion and quality of practical teaching by adjusting teaching content and methods, thereby improving students' programming abilities and overall quality.

Finally, by implementing these balancing strategies, we can foresee that the teaching quality of Python programming courses in higher vocational colleges in Jiangxi, China, will be significantly improved. Students' programming skills will be better developed, and their learning interest and initiative

homework evaluation methods, attention should also be paid to the assessment of students' practical abilities. Students' practical performance can be evaluated through various forms such as experimental reports, practical training results, and course design works. At the same time, evaluation methods such as student self-evaluation and peer evaluation can also be introduced to allow students to have a deeper understanding of their learning situation and room for improvement. Through a diversified evaluation system, students' abilities can be evaluated more comprehensively, providing strong support for teaching improvement and talent cultivation.

In summary, by optimizing the curriculum, strengthening practical teaching links, introducing project-driven teaching methods, and building a diversified evaluation system, the theoretical and practical teaching in Python programming courses in higher vocational colleges in Jiangxi, China, can be effectively balanced. Improve teaching quality and student learning results.

will be stimulated. At the same time, these strategies will also help promote the development of computer education in higher vocational colleges in Jiangxi, China, and cultivate more high-quality skilled talents that meet market demand.

##### ii. Suggestions on Python programming teaching in higher vocational colleges in Jiangxi, China

Based on the above conclusions, we make the following suggestions for Python programming teaching in higher vocational colleges in Jiangxi, China:

- Further optimize the curriculum to ensure a reasonable distribution of the proportion of theoretical and practical teaching. On the basis of retaining necessary theoretical knowledge, the class hours and content of practical teaching are appropriately increased to provide students with more hands-on practice opportunities.

- Strengthen the design and implementation of practical teaching links. By introducing practical projects and carrying out school-enterprise cooperation, practical teaching is closely integrated with market demand to improve students' practical abilities and professional qualities.

- Actively explore and introduce more effective teaching methods. Such as project-driven teaching methods, flipped classroom, etc., to stimulate



students' learning interest and initiative and improve teaching effects.

- Build a complete evaluation system to comprehensively evaluate students' abilities. In addition to the traditional written examination and homework evaluation methods, attention should also be paid to the assessment of students' practical abilities, such as evaluation through course design, practical training results, etc.

- Strengthen the construction of teaching staff and improve teachers' practical teaching capabilities. Through regular training, exchanges and learning, etc., the teaching level and professional quality of teachers are improved, providing a strong

guarantee for balancing theoretical and practical teaching.

In summary, Python programming teaching in higher vocational colleges in Jiangxi, China, needs continuous exploration and practice to achieve an effective balance between theory and practical teaching. By optimizing curriculum, strengthening practical teaching, introducing effective teaching methods, building and improving evaluation systems, and strengthening the construction of teaching staff, we can promote the improvement of the quality of Python programming teaching in higher vocational colleges in Jiangxi, China, and cultivate more high-quality students. Skilled talent.

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