

# A preliminary study on the theory and practice of basic bilingual teaching of information technology in universities

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**Abstract:** *This paper aims to explore the theory and practice of bilingual teaching of information technology foundation in higher education. Firstly, through an overview of bilingual teaching theory and an in-depth analysis of the characteristics and requirements of information technology foundation teaching, the paper discusses the integration of bilingual teaching and information technology foundation teaching. Secondly, from the perspective of practical exploration, the paper elaborates on the practical background and conditions of bilingual teaching, and provides detailed descriptions of teaching content, design, methods, and tools, while also summarizing teaching evaluation and reflection. Furthermore, a thorough analysis of the integration and prospects of theory and practice is conducted, discussing existing problems and challenges, and forecasting future trends in this field. Finally, by summarizing the research results of the paper, suggestions and prospects for bilingual teaching of information technology foundation in higher education are proposed, aiming to provide references and insights for relevant teaching practices.*

**Keywords:** *higher education, information technology foundation, bilingual teaching, theory and practice, teaching design*

## 1. Introduction

With the continuous deepening of globalization and the advent of the information age, higher education has emerged as a pivotal player in fostering international exchanges and collaborations. Information technology, recognized as one of the cornerstones of modern society, has seamlessly integrated into various aspects of higher education. Simultaneously, the concept of bilingual teaching, heralded as an emblem of international education, is steadily gaining traction and reverence within academic circles. Against this backdrop, the adoption of bilingual teaching methodologies for information technology foundation courses in universities has emerged as a focal point in educational discourse. This paper seeks to meticulously examine the theoretical underpinnings and practical applications of bilingual teaching in the realm of information technology foundation education within higher learning institutions. The overarching objective is to furnish both theoretical insights and pragmatic experiences that can catalyze the internationalization of information technology education, elevate educational standards, and nurture a cadre of globally competent professionals. To commence this exploration, the paper embarks on a comprehensive review and synthesis of bilingual teaching theory, elucidating its defining characteristics, inherent advantages, and applicability across diverse educational contexts.

## 2. Theory Discussion of Bilingual Teaching of Information Technology Foundation in Higher Education

### 2.1. Overview of Bilingual Teaching Theory

Bilingual teaching, as a teaching mode, aims to facilitate the development of students' language proficiency and subject knowledge by using two languages (usually the students' mother tongue and the target language) for instruction. Bilingual teaching theory originates from the fields of language acquisition and cognitive psychology, emphasizing the close relationship between language and subject knowledge, asserting that bilingual teaching can better stimulate students' interest in learning and improve their learning outcomes. Within bilingual teaching theory, several important concepts and

principles are proposed, such as the input hypothesis, output hypothesis, and cognitive load theory. The input hypothesis suggests that learners gradually acquire the target language through exposure to abundant input in that language. The output hypothesis emphasizes reinforcing and deepening language knowledge through actual use of the target language. Additionally, the cognitive load theory indicates that in the teaching process, the complexity of learning tasks should be controlled to enable students to effectively process information, thereby enhancing learning outcomes. In bilingual teaching of information technology foundation in higher education, bilingual teaching theory provides essential guidance and reference for educators. Teachers can design appropriate teaching activities and tasks based on the principles and methods of bilingual teaching theory to facilitate comprehensive development of students' language and subject knowledge. Simultaneously, bilingual teaching theory also serves as a reference for educational administrators, assisting them in formulating more scientific and effective bilingual teaching policies and measures to promote continuous improvement and development of bilingual teaching of information technology foundation in higher education[1].

## ***2.2. Characteristics and Requirements of Information Technology Foundation Teaching***

As an integral part of higher education, information technology foundation teaching possesses several significant characteristics and teaching requirements:

1) Strong technicality: Information technology foundation teaching encompasses various aspects such as computer hardware, software, and networks, thus requiring a strong technical and professional knowledge base. Teaching content includes basic computer operations, programming, database management, network security, etc., necessitating teachers to possess solid expertise and skills.

2) Emphasis on practicality: Information technology foundation teaching emphasizes practical operation and project applications, requiring students to consolidate and apply learned knowledge through hands-on experience. Therefore, emphasis should be placed on laboratory practices and project training during the teaching process to enhance students' practical skills and problem-solving abilities.

3) Rapid updates: The field of information technology develops rapidly, with new technologies and applications constantly emerging. Hence, information technology foundation teaching requires teachers to update teaching content and methods promptly, keeping pace with technological advancements to ensure the relevance of the curriculum.

4) Interdisciplinary nature: Information technology foundation teaching spans multiple disciplinary areas such as computer science, electronic engineering, mathematics, etc., exhibiting strong interdisciplinary characteristics. Therefore, integration and cross-application of interdisciplinary knowledge should be emphasized during the teaching process to cultivate students' comprehensive literacy and interdisciplinary thinking abilities.

Information technology foundation teaching exhibits characteristics and requirements such as strong technicality, emphasis on practicality, rapid updates, and strong interdisciplinary nature. In bilingual teaching of information technology foundation in higher education, teachers need to fully consider these characteristics and requirements, flexibly applying bilingual teaching modes and methods to promote students' comprehensive development and skill enhancement.

## ***2.3. Integration of Bilingual Teaching and Information Technology Foundation Teaching***

The integration of bilingual teaching and information technology foundation teaching aims to better meet the internationalization demands of information technology education and promote comprehensive development of students' language and professional knowledge. In this integration process, several aspects need to be carefully considered. Firstly, bilingual teaching emphasizes the integration and interaction of language and subject knowledge. In information technology foundation teaching, the use of the target language for classroom teaching, discussions, and practical experiments can enhance students' language proficiency while learning information technology. Secondly, in the integration of bilingual teaching and information technology foundation teaching, teaching content that aligns with bilingual teaching principles needs to be designed. Teachers can flexibly set teaching content and learning tasks based on students' language proficiency and professional needs, emphasizing both language application and subject knowledge acquisition. Additionally, the choice of teaching methods is crucial in this integration. Teachers can employ diverse teaching methods such as group discussions, case analyses, and practical experiments to enhance students' language communication and technical practical abilities. Lastly, timely assessment and feedback on students' language proficiency

and professional knowledge are essential during the teaching process. Through regular quizzes, assignments, and project assessments, students can identify their shortcomings and further improve learning outcomes. In conclusion, the integration of bilingual teaching and information technology foundation teaching aims to promote the comprehensive development of students' language and professional abilities. Teachers should leverage the advantages of bilingual teaching creatively, design teaching content and activities, provide students with richer and more diverse learning experiences, and further enhance the quality and level of information technology education[2].

### **3. Practical exploration of bilingual teaching of information technology in colleges and universities**

#### ***3.1. Practical Background and Conditions***

The practical background and conditions of bilingual teaching of information technology foundation in higher education are key factors for the successful implementation of this teaching model. In terms of practical background, higher education in the context of globalization faces increasing demands for internationalization. With the frequent development of multinational cooperation projects and international exchanges, cultivating talents with strong cross-cultural communication skills and a global perspective has become an important goal of higher education. Meanwhile, the rapid development and widespread application of information technology have made information technology foundation education an integral part of higher education. As for practical conditions, several aspects need to be considered. Firstly, faculty development is crucial. A faculty team with both professional expertise and experience in bilingual teaching is essential for the successful implementation of bilingual teaching. Secondly, the improvement of teaching facilities and resources is vital. Modern classrooms, laboratories, and advanced teaching equipment can effectively support the implementation of bilingual teaching models. Additionally, establishing a comprehensive teaching management system is necessary. This includes formulating relevant policies and regulations, arranging teaching resources reasonably, and establishing scientific evaluation mechanisms to ensure the smooth implementation and continuous development of bilingual teaching. The practical background and conditions of bilingual teaching of information technology foundation in higher education are critical factors in driving the successful implementation of this teaching model. Only by fully recognizing the importance of the practical background and conditions, and continuously strengthening the construction and improvement of teaching conditions, can we better promote the application and development of bilingual teaching models in information technology foundation education in higher education and contribute to the cultivation of more comprehensive international talents.

#### ***3.2. Teaching Methods and Tools***

The successful implementation of bilingual teaching of information technology foundation in higher education requires the flexible use of various teaching methods and tools to ensure comprehensive improvement in students' language and professional knowledge. Here are several common teaching methods and tools:

1) Interactive Teaching: Stimulate students' learning interests and encourage active participation and thinking through interactions between teachers and students, as well as among students themselves. Teachers can use methods such as classroom discussions, group cooperation, role-playing, etc., to guide students to actively participate and deepen their understanding and application of information technology foundation knowledge.

2) Project-Based Learning: Use projects as a platform for students to apply their knowledge and skills in practical projects. By designing challenging project tasks, students' learning motivation and creativity can be stimulated, and their problem-solving abilities and teamwork spirit can be cultivated.

3) Hands-on Practice: Emphasize practical operations and skill training. Through methods such as laboratory experiments and practical exercises, students can personally practice and master basic operation skills and problem-solving methods in information technology.

4) Multimedia Teaching: Enrich teaching content and improve teaching effectiveness by utilizing multimedia technology and online resources. Teachers can use multimedia teaching tools such as slideshows, videos, online courses, etc., to vividly demonstrate information technology-related concepts and applications, stimulating students' learning interests.

5) Personalized Teaching: Adopt personalized teaching methods based on students' learning

characteristics and levels to meet the diverse learning needs of different students. Teachers can design targeted teaching and guidance based on students' different levels and abilities through methods such as differentiated instruction and tiered teaching[3].

In summary, the flexible application of teaching methods and tools is key to the successful implementation of bilingual teaching of information technology foundation in higher education. Teachers should choose appropriate teaching methods and tools according to teaching objectives and student characteristics, create a rich and diverse teaching environment, stimulate students' learning interests and initiative, and improve teaching effectiveness and quality.

### ***3.3. Teaching Evaluation and Reflection***

Teaching evaluation and reflection constitute pivotal components in ensuring the efficacy of bilingual teaching in information technology foundation courses within higher education institutions. In the realm of teaching evaluation, instructors employ a multifaceted approach to gauge students' command over information technology fundamentals and their progression in language proficiency. Regular quizzes and examinations serve as the cornerstone of assessment, allowing educators to ascertain students' grasp of foundational knowledge. Assessment modalities encompass a spectrum of formats, including written tests, laboratory reports, and project assignments, facilitating a comprehensive appraisal of students' learning outcomes. Moreover, classroom performance evaluation assumes paramount significance. By scrutinizing students' engagement and contributions during class sessions, educators glean insights into their learning dispositions and comprehension levels, enabling timely adjustments to teaching methodologies and content delivery. In the domain of teaching reflection, educators engage in a cyclical process of introspection and analysis, endeavoring to refine their pedagogical practices. Through periodic reflection sessions, teachers meticulously assess the efficacy of their instructional approaches, identifying areas of strength and areas for improvement. By critically evaluating the nuances of the teaching process, educators discern patterns and trends, discerning viable strategies to enhance teaching methodologies and augment pedagogical efficacy. Furthermore, student feedback surveys serve as a potent instrument for introspection. By soliciting students' perspectives and insights, instructors gain valuable feedback regarding the efficacy of their teaching methodologies and the overall learning experience. Armed with this feedback, educators swiftly adapt their instructional strategies, addressing any shortcomings and fortifying teaching practices. By amalgamating a diverse array of evaluation methodologies and reflection strategies, educators orchestrate a holistic and nuanced assessment of teaching effectiveness. This multifaceted approach empowers instructors to iteratively refine their pedagogical practices, fostering continuous improvement in teaching quality and engendering enhancements in students' learning outcomes and competencies[4].

## **4. Combination and prospect of theory and practice**

### ***4.1. Analysis of the Interaction between Theory and Practice***

The integration of theory and practice is crucial for continuously improving the quality of bilingual teaching of information technology foundation in higher education. The interaction between theory and practice is mutually reinforcing. Firstly, theory provides guidance and support for practice. Research and exploration of educational theory can provide a scientific theoretical basis and methodological guidance for bilingual teaching of information technology foundation in higher education, guiding teachers to design appropriate teaching plans and content based on disciplinary characteristics and student needs. Secondly, practice continuously provides feedback and enriches theory. Challenges and issues encountered in practice can drive continuous improvement and development of theory, making it more relevant to practical teaching needs and situations. Through continuous theoretical exploration and practical innovation, a virtuous cycle between theory and practice can be promoted, advancing the continuous improvement and development of bilingual teaching of information technology foundation in higher education.

Looking ahead, the integration of theory and practice will continue to deepen and expand. With the continuous development of information technology and the trend of educational internationalization, bilingual teaching of information technology foundation in higher education will face new challenges and opportunities. In the future, it is necessary to further strengthen theoretical research and practical exploration to continuously improve teaching quality and level. At the same time, interdisciplinary

collaboration and international exchanges need to be enhanced, drawing on and absorbing advanced international educational concepts and teaching models to promote the development of bilingual teaching of information technology foundation in higher education towards a more international and innovative direction, making positive contributions to the cultivation of more internationally competitive talents.

#### ***4.2. Challenges and Issues***

Despite some progress in bilingual teaching of information technology foundation at universities, several challenges and issues persist. Firstly, insufficient faculty development is a major obstacle to improving the quality of bilingual teaching. Some teachers lack bilingual teaching experience and language proficiency, making it difficult to effectively conduct bilingual teaching. Secondly, inadequate teaching resources are also a limiting factor. Information technology foundation teaching requires advanced teaching equipment and technical support, but some universities' teaching facilities and resources lag behind teaching demands, affecting teaching effectiveness. Additionally, the uniformity of teaching content and methods is a concern. Some teachers overly rely on traditional teaching methods, lacking innovation and diversity, thus struggling to stimulate students' interest and initiative in learning. Furthermore, an incomplete evaluation system poses a challenge. The current evaluation system primarily relies on exam scores, lacking comprehensive assessment of students' overall abilities and language proficiency, thus failing to accurately reflect the effectiveness of bilingual teaching. Bilingual teaching of information technology foundation at universities still faces challenges and issues in faculty development, teaching resources, teaching content and methods, and evaluation systems. Addressing these issues requires joint efforts from society as a whole, including strengthening faculty training, optimizing teaching resource allocation, promoting teaching method innovation, and improving evaluation systems. Only through these measures can the continuous improvement and development of bilingual teaching models in information technology foundation education at universities be promoted[5].

#### ***4.3. Development Trends and Future Prospects***

In the future, bilingual teaching of information technology foundation at universities will evolve towards a more internationalized, diversified, and innovative direction. Firstly, as globalization continues to deepen, there is a growing demand for talents with cross-cultural communication skills and international perspectives. Consequently, the bilingual teaching model will see broader applications and promotions. With the increasing interconnectedness of nations and cultures, students equipped with bilingual skills will be better prepared to thrive in diverse professional environments, contributing to global collaboration and innovation. Secondly, the rapid development and widespread application of information technology will provide more teaching resources and application scenarios for bilingual teaching. This technological advancement will not only offer new tools and platforms for language learning but also create dynamic environments for the integration of language and technology. Teachers will have access to a wide range of digital resources and educational software, enabling them to design engaging and interactive lessons that cater to students' diverse learning styles and preferences. Moreover, the real-world applications of information technology will serve as compelling contexts for language acquisition, motivating students to engage actively in their language and subject studies. Additionally, the content of information technology foundation education will be more closely aligned with practical application needs, cultivating students' practical skills and problem-solving abilities to better meet societal talent demands. As industries continue to evolve and innovate, there will be an increasing emphasis on preparing students for the challenges of the digital age. Information technology foundation courses will incorporate hands-on projects, case studies, and industry collaborations, allowing students to apply their knowledge in authentic contexts and develop the critical thinking skills necessary for success in the workforce. In the future, the bilingual teaching model will place more emphasis on cultivating interdisciplinary and comprehensive abilities. It will not only focus on improving students' language proficiency but also on developing their professional knowledge and practical application abilities. Teachers will adopt an integrated approach to teaching, encouraging students to make connections between language learning and their chosen fields of study. Through collaborative projects and interdisciplinary coursework, students will develop a holistic understanding of information technology and its broader implications for society. Furthermore, the evaluation system will be more comprehensive and scientific, not only focusing on students' academic achievements but also comprehensively assessing their overall abilities. This holistic approach to assessment will provide a more accurate reflection of students' strengths and areas for improvement, guiding personalized

learning pathways and fostering continuous growth and development. Additionally, feedback mechanisms will be strengthened, providing students with timely and constructive feedback to support their ongoing learning journey. Bilingual teaching of information technology foundation at universities will move towards a more internationalized, diversified, and innovative direction, making greater contributions to cultivating talents with international competitiveness and continuously enhancing education quality. With the continuous development and progress of society, the bilingual teaching model will undoubtedly encounter broader development space and a brighter future, empowering students to thrive in an increasingly interconnected and technology-driven world.

## 5. Conclusion

Bilingual teaching of information technology foundation in higher education, as a teaching model integrating language learning and the cultivation of professional knowledge, holds significant importance in promoting students' language proficiency and professional competence. Through the exploration of the theory and practice of bilingual teaching of information technology foundation in higher education, this paper draws several conclusions: Firstly, bilingual teaching theory provides vital theoretical guidance and methodological support for the bilingual teaching of information technology foundation in higher education, offering teachers valuable insights for designing appropriate teaching content and methodologies. Secondly, the practice background and conditions are crucial factors influencing the implementation of bilingual teaching of information technology foundation in higher education. Only by fully recognizing the importance of the practical background's requirements and conditions and continuously strengthening the construction and improvement of teaching conditions can the application and development of bilingual teaching models in higher education information technology foundation education be better promoted. Furthermore, the flexible application of teaching methods and means is the key to the successful implementation of bilingual teaching of information technology foundation in higher education. Teachers should select suitable teaching methods and means according to teaching objectives and student characteristics, creating diverse and dynamic teaching environments to enhance teaching effectiveness and quality. Lastly, the future development of bilingual teaching of information technology foundation in higher education will trend towards greater internationalization, diversification, and innovation. In the context of globalization, the bilingual teaching model will be more widely applied and promoted, making a greater contribution to the cultivation of talents with international competitiveness. Bilingual teaching of information technology foundation in higher education holds significant theoretical significance and practical value. It will continue to grow and improve in the future, making positive contributions to enhancing the quality of higher education in information technology foundation and innovating talent cultivation models.

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