A Study on English Learning Motivation of Computer Science Majors in China

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Abstract. The process of English learning among college students has a profound impact on their psychological factors and learning outcomes. English plays a crucial role in the field of computer science. It not only builds upon basic English but also encompasses a comprehensive understanding of computer science. Computer English serves as a vital tool for Computer Science (CS) students to improve their expertise and achieve better self-development. This paper primarily examines the current state of insufficient English learning motivation among college students majoring in CS in China, analyzes the significance and influencing factors of learning English, and subsequently proposes practical strategies to stimulate and cultivate college students' English learning motivation.

Keywords: College students; Learning motivation; Computer English; English learning suggestions.

1. Introduction

1.1 Research Background

In recent years, English has emerged as a crucial common language and an essential tool for international communication. The utilization of English holds a preeminent position globally, concerning both the number of users and the breadth of its application. As the future builders and developers of the world, it is crucial for college students to have a high level of English proficiency for their personal growth and the development of their nation. Consequently, the acquisition of English is of paramount importance. With the exponential growth of technology, Computer Science (CS) has become a vital part in people's daily lives and work. Numerous industries rely heavily on technology to empower their business, including factory automation and office automation. Schools are also employing multimedia-based teaching in their courses. Individuals seeking proficiency in computer technology must possess a minimum level of English proficiency, particularly for CS students. Computer software and hardware adhere to universal standards, the majority of which are authored in English. As an integral branch of English for science and technology, computer English encompasses a wide array of disciplines, such as computer hardware and software, computer security, network communication, and e-commerce, as noted by Su Biying [1]. Consequently, CS majors must employ English to effectively utilize computer knowledge, programming, research, and access to various information, as well as to communicate with the international computer science community. Regrettably, some CS majors exhibit a lack of enthusiasm and motivation for English learning, resulting in subpar academic performance. Therefore, the primary focus of this study is to explore strategies for fostering positive motivation among CS majors toward English learning. By analyzing and investigating the English learning motivation of CS students in China, effective learning suggestions can be derived to significantly enhance their English proficiency.

1.2 Research Significance

According to Dornyei and Ushioda, "Motivation serves as the bridge connecting language learners to their aspirations and goals [2]." Learning motivation plays a crucial role in the academic journey of college students. Despite a large number of previous studies on learning motivation, few

studies have focused on the English learning motivation of current CS students in China. Consequently, this study holds innovative value in the area of learning motivation. By examining the crucial factors influencing English learning motivation among Chinese college students majoring in CS, this study aims to stimulate their enthusiasm for learning English, ultimately fostering a more effective English learning experience for this specific group. Thus, the significance of this study is not only theoretical but also practical. For CS students and educators, it is valuable to understand the types of motivation that can stimulate their English language learning potential and provide a better understanding of the most advanced computer knowledge internationally.

2. Research Objectives

Based on an analysis of the current state of English learning motivation among college students majoring in CS in China, and drawing upon literature review, this study delineates the factors contributing to the lack of English learning motivation among these students, endeavors to detail the necessity of mastering English for these students, and provides corresponding suggestions on how to motivate college students' interest in English learning.

This research aims to investigate the following three research questions:

(1) What underlying factors contribute to the lack of English learning motivation among current CS students in China?

(2) Why is it crucial for current CS students in China to prioritize English learning?

(3) How can we stimulate the English learning motivation of current CS students in China?

3. Factors affecting English learning motivation

3.1 According to Liao Yuhuan, the primary factors influencing college students' motivation to learn English consist of personal factors, school-related factors, and learning environment factors [3]. Students' characteristics, learning abilities, and self-efficacy affect their motivation to learn. Students who lack curiosity, have limited self-control, low self-efficacy, and low self-expectations are less likely to demonstrate intrinsic motivation to learn. As the main channel for current college students to acquire knowledge, the teaching quality and course curriculum of schools have an important impact on students' motivation to learn. In addition, learning resources, learning environment, learning conditions and other factors also affect students' learning motivation. Adequate learning resources coupled with good learning environment and conditions can facilitate students to engage in English learning, thus improving their learning motivation.

3.2 For the majority of students who are not majoring in English, the acquisition of the language represents a significant challenge. All institutions of higher education in China uniformly provide English courses. It is a mandatory subject that students are required to take every semester. Nonetheless, the proficiency of these students in English ranges significantly. Some of these students lack interest in English and learn English only for the purpose of passing the examination. Some students even show fatigue and anxiety in learning English due to their lack of English proficiency. Consequently, this results in a negative attitude towards English learning, along with a dearth of enthusiasm and proactiveness in their studies.

3.3 According to Wang Yichen, a significant portion of students possess learning concepts that stray from the right track. Their primary motivation for studying English is often utilitarian, with some even viewing "successfully passing English exams" as their only goal [4]. This indicates that these students lack a high degree of learning autonomy, making it challenging for them to take the initiative to learn beyond the scope of instruction. However, there are distinct differences between the test content and assessment criteria of general English and computer-related professional English. In other words, the knowledge gained from studying general English may not fully meet the requirements of computer-related professional English.

3.4 Many college students do not sufficiently recognize the importance of English in learning computer science, which leads to insufficient motivation for learning English. In other words, students rarely integrate the study of computer science with the study of English. Essentially, English for CS majors represents an organic amalgamation of computer science and English, encompassing not only an in-depth exploration of computer science but also a promotion of English proficiency. However, many students regard the English courses only as the learning of "English language" rather than as a supplement to improve their professional knowledge of CS. They may not be using the interdisciplinary approach that can link interdependent knowledge and skills across multiple subject areas, hindering their ability to master computer science knowledge effectively and their English language proficiency.

4. Factors affecting English learning motivation

4.1 Learning needs

The latest technology in the science and technology industry is evolving at a rapid pace. Currently, the latest technological breakthroughs and a significant portion of the literature and technological inventions in the field are created, archived, disseminated and communicated in English. It is worth noting that mainstream computer programming languages, technical documents, and related application software interfaces are also presented in English. This suggests that if CS students are not proficient in English, they may find it difficult to fluently access more up-to-date technical documentation and learn about cutting-edge technologies, which may hinder their programming skills from improving.

The exchange of information on the Internet has been accompanied by an influx of online learning resources. CS students can access a wide range of learning materials through the Internet. For example, on video-sharing platforms such as YouTube, many technical experts share educational videos related to computer science, information technology and artificial intelligence,etc., most of which are mainly in English. Students whose first language is not English need to learn English to understand the content of these videos. Similarly, websites such as GitHub (an open-source code platform) and Stack Overflow (an online community for sharing programming knowledge), which facilitate global communication between CS and IT enthusiasts and practitioners, are mainly used by English speakers. It is therefore important for CS students to learn English and use it to learn and share their knowledge on these websites.

4.2 Usage requirements

The characteristics of computer English are mainly reflected in the text and vocabulary. The linguistic structure of computer English text is characteristic of scientific English. Different from the English that will be used in daily life, computer English has a large number of technical terms, and the same word has different meanings in different examples of use. Many common English words will have some changes in their meanings in Computer English. For example, *bus* usually refers to a form of transport that people use to travel, whereas in computer English, *bus* refers to a communication system that transfers information between components. This is also reflected in acronyms terms. For example, *CPU* stands for Central Processing Unit; *IP* stands for Internet Protocol; in Linux commands, *cat* refers not to an animal but to displaying the contents of a file on the terminal; and *touch* does not refer to an action, but to creating a empty file. According to Zhang Wei, this specialization is also reflected in information technology and the Internet, World Wide Web and e-commerce, system software, hardware system components, central processing unit, input and output devices, storage architecture, communication and network, network security, etc. [5]. In addition, when writing programs, students are encouraged to name variables in concise English and to use comments to explain the code they have written, re-emphasizing the importance

of English in the CS major and motivating students' to learn English. Moreover, words that are often used in programming can be learned by students in a passive way.

students will encounter the situation that they need to name variables and explain the code in English, which forces computer students to name variables and make comments for the code in English through concise and easy to understand English words.

4.3 Personal development

With globalization, many companies in China have begun to require candidates to pass an English proficiency test at CET-4 level or an advanced level. In some cases, companies even use English interviews to assess students' fluency in English. This requirement is not limited to CS students, but also applies to recent graduates from other majors. For candidates, having a high level of English proficiency can lead to more interview opportunities and a higher interview success rate. It is therefore vital for CS students to learn English for their personal development and to improve their competitiveness in the job market.

In addition, given the global nature of the technology industry, various companies and software development teams are dispersed around the world, many of which engage in cross-border collaboration. These teams require English as a working language. If CS students want better career opportunities, they must learn English to demonstrate their ability to work with people from all over the world.

5. Suggestions

In recent years, given the growing prevalence of English usage, it has become imperative for universities and vocational colleges in China to incorporate English as a compulsory course in order to better align with the progression of globalization. Consequently, proficiency in English has been recognized as one of the crucial skills that students must master.

5.1 To effectively facilitate English learning, educators must foster students' authentic interest and elevate their academic motivation. English instruction is an intricate process involving numerous variables, with teaching methodologies significantly influencing students' attitudes. Teachers should comprehend each student's learning psychology and individual differences to tailor their instruction accordingly. Consequently, English educators must comprehend students' learning motivation and progress to optimally activate students' learning engagement and enhance their academic outcomes. Teachers can invigorate students' enthusiasm for learning and encourage their participation in the classroom through adaptable and diverse instructional organization formats. For instance, teachers can establish a supplementary class for students to engage in English learning outside the classroom. This may include regular offline English communication activities, enabling students to practice oral English with one another, share academic knowledge and experiences, thereby fortifying their language sensibility and academic capabilities. Moreover, while imparting language knowledge, teachers should also guide students to harmonize the relationship between English learning and their major field of study, allocating time scientifically to cultivate students' proficient learning habits and self-study abilities.

5.2 The sharing and acquisition of a wealth of English teaching resources are crucial strategies for enhancing teaching effectiveness and quality. By sharing resources, such as Internet search engines, educational websites, and apps, teachers can broaden students' English perspectives. Upon exploring the educational resource library, students can engage in inquiries with their teachers to stimulate their cognitive abilities and curiosity. Additionally, teachers can employ innovative teaching methods based on student feedback, thereby fostering students' interest and effectiveness in English learning and stimulating the development of their English learning motivation.

5.3 The primary determinant of English learning motivation among CS majors is the lack of interest in the language, which results in their disinterest towards the specialized vocabulary of

computer English. To address this, English teachers can integrate computer professional knowledge into their teaching, and disseminate fundamental and applied computer professional English knowledge to students. This may include topics such as processors, memory, databases, C language, multimedia technology, artificial intelligence, and software engineering. These technical English terms are directly related to students' professional understanding. By exposing students to these concepts in English classes, their appreciation for the practicality of English can be enhanced, thereby stimulating their enthusiasm for learning. Furthermore, Chinese universities can collaborate with enterprises to provide opportunities for English communication and practice, such as conducting mock English interviews, business English negotiations, career planning lectures, and other activities. These events can not only help students comprehend the demands of the job market but also aid them in better adapting to the workplace, thereby emphasizing the significance and practicality of English.

6. Summary

In conclusion, Chinese college students majoring in CS should rectify their perspective on English education, emphasize the significance of knowledge, and avoid over-emphasis on practicality. Despite English being a challenge for most non-English majors, numerous methods exist to enhance their English proficiency. Instructors can employ innovative teaching methods, enhance the appeal of the subject, stimulate students' curiosity and desire for knowledge, and further invigorate their learning motivation. Instructors can also provide practical experience in computer-related English so that students can improve their English by intensive use of the language..

Authors Contribution

All the authors contributed equally and their names were listed in alphabetical order.

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