The Coupling Relationship of Digital New Quality Productivity and Employment of English Majors in Science and Engineering from Students' Perspectives

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Abstract: In the era of digital economy, the traditional production and new factors of production, such as digit and data, have formed a new quality of productivity after realizing the deep integration. As a result, the industrial structure is accelerating its transformation and upgrading, which puts forward new requirements for contemporary employment. The demand for talents presents new characteristics, especially the English majors in science and technology are more affected by it. While the employment quality of these graduates not only concerns their personal development, but also closely related to the sustainable development of the school and the society. In addition, under the background of new digital productivity, students of English majors in science and technology are facing numerous difficulties, so exploring from the perspective of students can help them to establish and accept the cognitive gap, and accurately plan their academic and career paths. Therefore, it is of great practical significance to deeply study the coupling relationship between digital productivity and the employment of S&E English majors

1. The Coupling Relationship

1.1 The Impact of Digital New Quality Productivity on the Employment of English Majors in Science and Engineering

New quality productive forces is a new term first put forward September 2023.[1] It is emphasized that efforts should be made to integrate scientific and technological innovation resources, lead the development of strategic emerging industries and future - oriented industries, and accelerate the formation of new - quality productive forces. So new - quality productive forces are in contrast to traditional productive forces. In different historical stages of human society, the technological support and tools on which the development of productive forces depends are different. With future industries and strategic emerging industries as the carrier, the new quality productivity is characterized by innovation; the key is quality; and the essence is the contemporary advanced productivity.

Focusing on original and disruptive scientific and technological innovation, the new quality productivity affirms the positive role of science and technology in the progress of productive forces. Focusing on the improvement of total factor productivity, it explains the economic growth that can not be explained and measured by a single factor input, and proposes that the integration of technological and institutional innovation of multiple production factors is the fundamental breakthrough point for economic and social development in the coming period.[2] Therefore, the development of new digital productivity has impacted some of the traditional English-related positions. For example, the development of Al technology has greatly improved the accuracy of machine translation, forcing English majors to seek employment in related jobs; new positions such as digital content localization specialists, cross-border e-commerce language operations continue to emerge; traditional positions such as intelligent collaborative translation of scientific and technical documents have undergone digital transformation, so that the job demand for skills presents a diversified trend. On the other hand, it has also promoted the reform of the talent cultivation model for English majors, emphasizing the reshaping of students' competitiveness in employment, and

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setting higher requirements for students to be equipped with interdisciplinary ability and practical skills. Digital skills have become the core competitiveness elements.

However, there is still a partial disconnection between the knowledge structure of contemporary foreign language majors and the market demand, and the continuous improvement of foreign language proficiency of non-foreign language majors has squeezed the employment space of foreign language majors, resulting in an unfavorable employment outlook and limited employment directions for English major graduates.[3]

1.2 The contribution of employment of English major in science and technology to digital new quality productivity

The core advantage of this major lies in the composite ability of "language +science and technology + cross-domain adaptation", which can quickly adapt to the demands of new digital productivity, accurately meet the needs of digital and internationalized positions, and effectively expand the overseas market, in line with the needs of contemporary composite talents. In terms of transnational business communication and cooperation, they have professional language transformation ability, not only mastering the core language skills of English listening, reading writing and translating, but also familiar with the terminology and technical logic of science and technology fields such as machinery, electronics, computers, enabling them to complete the tasks with high quality and at low cost. At the same time, their higher cross-cultural technical cooperation ability can avoid cultural misunderstandings and conflicts in international project alignment and overseas technology promotion, reducing cross-cultural collaboration costs. On the whole, it is conducive to the alignment of international standards and the dissemination of industry norms.

In promoting the innovation and application of digital technology, students obtain global cutting-edge science and technology literature and patent information by virtue of their English language advantage, and then screen and integrate valuable content through their science and technology foundation to provide cross-language information support for enterprise technology research and development , such as Al algorithm optimization, smart manufacturing upgrading, and build a promotional bridge relying on bilingual capabilities. On the one hand, we export digital technology application cases to overseas markets in English such as domestic smart factory solution; on the other hand, we transform overseas users' feedback into technical optimization suggestions, helping domestic digital technology to be applied in the international market, and at the same time, it also promotes domestic technological iteration in a reverse manner, stimulates the inspiration of technology research and development, and helps improve the efficiency of technological innovation. English majors in science and engineering have advantages in Digital training and promotion for technology application. They can participate in the training of digital technology, transform complex technical knowledge into understandable language, providing training services for enterprise employees and the public and improving their understanding and application of digital technology. [3]

2. Challenges for the Coupling Mechanism

2.1 Supply Factors on the Talent Side

The new digital quality productive forces reconfigure the production process of society through digital technologies such as artificial intelligence, big data and cloud computing, thereby transforming workplace demands into an integration of cross-lingual communication and digital tool application. Huang (2020) pointed out that the popularization of foreign language skills and the intelligentization of translation tools have significantly reduced the market demand for low-to-mid-end foreign language talents.[6] On one hand, English has become a universal skill among workplace professionals and student groups, no longer an exclusive "professional skill" owned by English majors; on the other hand, intelligent translation tools have met the social demand for daily foreign language translation. These two factors have compressed the employment space for low-to-

mid-end foreign language graduates, raised the competency threshold set by employers for foreign language talents, and intensified employment competition.

However, most students' current competence structure fails to meet this integrated demand—they are used to separating English from other fields in their job search, and even if they have learned some digital skills, they do not actively think about how these skills can be combined with English. Some students are reluctant to engage with digital technologies, or they just stay at the "basic operation" level, without active exploration. For example ChatGPT, a generative writing tool, students only know that this tool will replace English posts, rather than actively thinking and learning how to use this tool to assist English writing and quickly organize information. So students should use the tools well and turn new technology into efficiency.

2.2 External Environmental Factors

Against the backdrop of the digital new quality productive forces driving dramatic changes in social production and employment patterns, English major students are confronted with multiple external challenges in their development. These challenges cover various dimensions such as the teaching system and the job market, which are intertwined. Among them, the serious disconnect between teaching content and the demands of digital new quality productive forces, as a representative issue in the external environment, directly affects the matching degree between students' skill cultivation and market demands, which urgently requires attention and solution.

2.2.1 The Mismatch between Pedagogical Content and the Demands of New Digital Quality Productive Forces

The "homogenization" of the training programs for English majors in university of science and engineering is very serious, and most of the teaching contents still revolve around the cultivation of traditional "listening, reading, writing and speaking" language skills, and are seldom combined with digital skills and majors of science and engineering.[7] Taking translation teaching as an example, most instructors only guide English majors in text translation and seldom introduce intelligent translation tools in the course of classroom teaching. In translation teaching, we should not limit ourselves to basic translation, but also familiarize ourselves with the use of intelligent translation tools.

2.2.2 Job Market Changes Driven by New Quality Productive Forces

The rapid development of artificial intelligence, a core driver of new quality productive forces, gradually crowds out the employment channels of English majors. With the popularization of intelligent translation tools, the market demand for low-end English talents, who can only perform basic translations, document sorting, or cross-border communications, is greatly reduced. Traditional translators require time for training, proofreading, and it will. However, these intelligent translation tools can generate high-accuracy translations of common professional documents in seconds, greatly saving enterprises' costs and efficiency. Owing to these benefits, enterprises are not satisfied with employees who only "can speak English"; instead, they need more interdisciplinary talents with "English proficiency + digital skills + professional expertise".

3. Short-term and Long-term Strategies

3.1 Short-term strategy: Student Empowerment

3.1.1 Constructing "English + Digital" Competency Combinations

English majors need to break the cognition of "pure language tools" and proactively bind English with digital skills. Learning should be "precisely adapted" career directions. Those in cross-border data operation direction can focus on Excel data analysis. Those in translation can skillfully use intelligent translation tools such as DeepL. Those in overseas communication can learn to use tools such as "CapCut" for short video editing. This "on-demand" approach allows digital skills to

enhance the value of English, for example, using Excel to comb through overseas customer communication data to avoid a "learning and use disconnect."

3.1.2 Developing an Employment Mindset for the Digital Age

As digital new-quality productive forces reshape the job market, English majors need to adjust their employment mindsets to connect language skills with digital demands. The following are two mindsets:

First, it's essential to cultivate the mindset of identifying cross-boundary positions, Students need to shift from the traditional view that English majors can only be translators and teachers to proactively exploring new positions such as English digital operation and AI translation assistance, which are shaped by digital new-quality productive forces. Second, it's vital to develop the mindset of using digital tools to amplify the value of English competence. When applying for a job, students should reflect their digital-related experiences in resumes—for instance, using Canva to design product promotion graphics with English copy and using Excel to organize English users' feedback of a cross-border app, such as creating categorized lists of English complaints to help the team identify key user pain points.

Together, these two mindsets provide English majors with more possibilities for job-hunting in the digital age.

3.2 Long-Term Strategy: Curriculum Reform in Universities of Science and Engineering

Universities of science and engineering need to reconstruct the cultivation objectives for English majors and strengthen their "humanities + science" dual attributes. On one hand, they should retain courses like literature appreciation and cross-cultural communication to consolidate students' humanities foundation; on the other hand, they need to incorporate modules such as scientific and technological English and engineering literature interpretation, and guide students to analyze mechanical English manuals and electronic field theses. This approach will help students meet the demands of cross-border technology and highlight the comprehensive value of "humanities + science".

3.2.1 Build "Foreign Language + Engineering" Curriculum System

Universities of science and engineering focus should fully tap into and make use of their abundant science and engineering resources, promote the joint development of interdisciplinary courses between English majors and science & engineering majors, and build a "course + practice" curriculum system. Examples include interdisciplinary courses such as "Engineering English + Digital Marketing" and "Intelligent Translation + Mechanical Design".

At the level of professional practice, universities can organize students to participate in the collation of science and engineering literature. During this process, students can be guided to use intelligent translation tools as auxiliary support to enhance their efficiency in verifying professional terms. As Qian, Zhu and Ding emphasized, such practice can also extend to encouraging students to engage in English competitions and speech contests, which act as platforms for showcasing their capabilities. These activities not only stimulate students' learning motivation to continuously refine their language expression and boost confidence but also prompt them to read extensively and think deeply during preparation, thereby enhancing their comprehensive language application skills.[4] In addition, universities can build practical platforms and organize students to participate in the preparation of international conferences in engineering, the translation of overseas product manuals, etc., so that students can apply their "English + digital + professional" abilities in real scenarios. These practices not only avoid homogeneous competition, but also cultivates interdisciplinary talents, thus realizing the long-term optimization of the coupling mechanism.

3.2.2 Deepening the Integration of Industry and Education

Based on the new social requirements and development situation of digital new-quality productive forces, and with employment as the ultimate orientation, universities with science and engineering focus should actively carry out the school-enterprise cooperative training model,

optimize the design of professional courses, and develop characteristic courses that meet industry needs by leveraging their high-quality science and engineering resources.[5]

In addition, enterprises should proactively participate in talent cultivation and strictly control the level of students' practical abilities. Combining the requirements of digital new quality productive forces and specific industries, enterprises should provide universities with concrete and operable practical plans—such as clarifying digital scenario-based needs like AI optimization requirements for English product manuals and operation standards for English content on overseas social media. They should also participate in curriculum design and integrate enterprise digital tool usage specifications and job competency requirements into teaching.

At the same time, enterprises can set up short-term internship positions such as English digital operation assistants and AI translation support roles, provide a "practice + employment" connection channel, and co-establish a talent recommendation mechanism with universities. They should give priority to recruiting English major students with digital skills, forming a positive cycle of "enterprises put forward demands - universities cultivate talents - enterprises employ talents" to help the in-depth integration of English majors with digital new-quality productive forces.

4. Conclusion

It can be seen from the above that the new quality productivity and the employment of English majors are both closely related and mutually reinforcing. The new quality productivity provides more opportunities for the employment of English majors and the internal power of sustainable development. And the comprehensive development of English majors injects new vitality into the new quality productivity. In the future, the synergistic development of the two should be further promoted to facilitate the overall development of individuals and society.

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