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Research on the Multi-Dimensional Dynamic Evaluation Mechanism for Foreign Language Talents in Energy and Power Universities from the Perspective of New Quality Productive Forces

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Abstract: *This paper delves into the multi-dimensional dynamic evaluation mechanism for foreign language talents in energy and power universities from the perspective of new quality productive forces. It first analyzes the new requirements that new quality productive forces place on the cultivation of foreign language talents in such universities, elucidating the necessity of constructing this multi-dimensional dynamic evaluation mechanism. It then elaborates on the theoretical foundations, construction principles, and framework of this mechanism. Subsequently, it explores specific strategies for constructing the mechanism, focusing on the evaluation indicator system, evaluation methods, evaluation subjects, and evaluation feedback and adjustment. The aim is to provide valuable references for the cultivation and evaluation of foreign language talents in energy and power universities.*

Keywords: *New Quality Productive Forces; Energy and Power Universities; Foreign Language Talents; Multi-Dimensional Dynamic Evaluation Mechanism*

1. Introduction

With the rapid advancement of science and technology and continuous societal progress, new quality productive forces (NQPF) have gradually become the core driver of economic and social development. NQPF, characterized by high efficiency, intelligence, and sustainability, with scientific and technological innovation as its core driving force, imposes higher demands on talent cultivation. As a crucial pillar of national economic development, the energy and power industry is experiencing increasing internationalization, creating an urgent need for compound talents proficient in both energy and power expertise and foreign languages.

Energy and power universities serve as vital bases for cultivating professionals in this industry, where foreign language teaching plays a significant role in talent development. However, traditional evaluation mechanisms for foreign language talents suffer from problems such as singular evaluation criteria, static evaluation methods, and limited evaluation subjects, making them inadequate to meet the demands under the NQPF framework. A multi-dimensional dynamic evaluation mechanism can comprehensively assess multiple dimensions of foreign language talents, dynamically adjust based on their development, and provide a more holistic and objective evaluation of their overall qualities and competency levels. Therefore, researching this mechanism from the NQPF perspective holds significant practical importance.

2. New Requirements of New Quality Productive Forces for Foreign Language Talent Cultivation in Energy and Power Universities

2.1 Possession of Interdisciplinary Knowledge and Innovation Capability

The development of NQPF has intensified the convergence between the energy and power industry and foreign language disciplines. Foreign language talents in energy and power universities must not only master solid linguistic knowledge and skills but also understand relevant industry knowledge, such as new energy technologies, power system operation, and energy management. Concurrently, they need innovation capabilities to identify and solve problems within interdisciplinary fields, providing novel ideas and methods for the industry's international development. For instance, in international energy

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and power cooperation projects, foreign language talents need to apply interdisciplinary knowledge to propose innovative solutions, facilitating project success [1].

2.2 Possession of Global Vision and Cross-cultural Communication Competence

With increasing international cooperation in the energy and power sector, foreign language talents must possess a global vision, understand international market dynamics and trends, and be familiar with international rules and standards. Additionally, they require strong cross-cultural communication competence to effectively communicate and collaborate with individuals from diverse national and cultural backgrounds. For example, at international energy conferences, they must accurately comprehend the viewpoints and intentions of foreign representatives while clearly expressing their own ideas and suggestions, avoiding misunderstandings and conflicts arising from cultural differences.

2.3 Adaptability to Industry Demands and Rapid Learning Capability

The rapid development of the energy and power industry, marked by constant emergence of new technologies and concepts, necessitates that foreign language talents quickly adapt to changes and continuously acquire new knowledge and skills. For instance, with the rapid advancement of new energy technologies, they need to promptly master relevant professional terminology and technical literature to enhance their language application capabilities in this field. They must also possess rapid learning capabilities to acquire new knowledge and skills efficiently to meet evolving industry demands.

3. Necessity of Constructing the Multi-dimensional Dynamic Evaluation Mechanism

3.1 Overcoming the Drawbacks of Traditional Evaluation Mechanisms

Traditional evaluation mechanisms for foreign language talents often prioritize examination scores, neglecting the comprehensive qualities and developmental trajectory of talents. Evaluation methods tend to be static, typically conducted once at the end of a semester or academic year, failing to reflect ongoing progress and changes. Evaluation subjects are also limited, predominantly relying on teacher assessment, lacking diversified subjects such as self-evaluation, peer evaluation, and social evaluation. The multi-dimensional dynamic evaluation mechanism can overcome these drawbacks by providing a comprehensive and objective assessment of talents' overall qualities and competency levels [2].

3.2 Meeting the Needs of Talent Evaluation under New Quality Productive Forces

NQPF requires talent evaluation to focus not only on existing capabilities but also on developmental potential and innovation capacity. The multi-dimensional dynamic evaluation mechanism can comprehensively consider multiple dimensions of foreign language talents—such as knowledge mastery, skill application, innovation capability, and teamwork ability—and adjust dynamically based on their development. Through diversified evaluation methods and subjects, it enables a more comprehensive and accurate assessment, providing robust talent support for the development of NQPF.

3.3 Promoting the Holistic Development of Foreign Language Talents

The multi-dimensional dynamic evaluation mechanism provides timely and accurate feedback, helping talents understand their strengths and weaknesses and identify areas for improvement. Simultaneously, through diversified evaluation subjects and methods, it stimulates learning motivation and initiative, promoting holistic development. For example, self-evaluation and peer evaluation cultivate self-reflection and teamwork spirit, while social evaluation helps talents understand societal demands and expectations, allowing them to better adjust their learning and development paths [3].

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4. Theoretical Foundations, Construction Principles, and Framework of the Multi-dimensional Dynamic Evaluation Mechanism

4.1 Theoretical Foundations

Theory of Multiple Intelligences: This theory posits that human intelligence is multifaceted, encompassing linguistic, logical-mathematical, spatial, bodily-kinesthetic, musical, interpersonal, intrapersonal, and naturalistic intelligences. Individuals exhibit varying levels of development across these intelligences. Therefore, evaluation should consider multiple intelligences to provide a comprehensive and objective assessment of abilities and potential. For foreign language talents in energy and power universities, beyond linguistic intelligence, interpersonal intelligence (e.g., cross-cultural competence) and intrapersonal intelligence (e.g., self-reflection and learning ability) should also be evaluated [4].

Developmental Assessment Theory: This theory emphasizes that the purpose of evaluation is to promote student development, not merely for selection or screening. Evaluation should focus on the learning process and developmental changes, providing timely feedback to help students adjust learning strategies and improve outcomes. The multi-dimensional dynamic evaluation mechanism is grounded in this theory, using a dynamic process to track progress and growth.

Constructivist Learning Theory: This theory views learning as an active process of knowledge construction by the learner, not passive reception. Learners integrate new knowledge with existing experiences through interaction with their environment. The multi-dimensional dynamic mechanism encourages active participation in evaluation (e.g., self and peer assessment), fostering reflection on the learning process and outcomes, thereby enhancing knowledge construction and skill development.

4.2 Construction Principles

Comprehensiveness Principle: Evaluation should encompass multiple dimensions of the foreign language talent (knowledge, skills, abilities, qualities) for a holistic and objective assessment. The indicator system should cover language knowledge, language skills, cross-cultural competence, innovation capability, teamwork ability, etc.

Dynamism Principle: Evaluation should dynamically adjust based on the talent's development, promptly reflecting progress during the learning process. Regular evaluations can inform adjustments to teaching strategies and learning plans to support continuous development.

Diversity Principle: Evaluation subjects should be diverse (teachers, self, peers, society); evaluation methods should be varied (exams, assignments, projects, practice, interviews). This diversity ensures a more comprehensive and accurate assessment.

Motivational Principle: Evaluation should motivate, stimulating learning initiative and promoting holistic development. Results should be fed back promptly, allowing talents to understand strengths/weaknesses and set goals. Appropriate rewards and encouragement can boost confidence and motivation [5].

4.3 Construction Framework

The multi-dimensional dynamic evaluation mechanism primarily consists of: the evaluation indicator system (foundation, defining content and criteria), evaluation methods (means of implementation), evaluation subjects (participants: teachers, students, society), and evaluation feedback and adjustment (providing feedback based on results and using it to adapt teaching/learning strategies for continuous development).

5. Specific Construction Strategies for the Multi-dimensional Dynamic Evaluation Mechanism

5.1 Constructing a Scientific and Reasonable Evaluation Indicator System

Knowledge Dimension: The evaluation system needs to systematically sort out the knowledge reserve structure of foreign language talents in the field of energy and power, covering the basic content of specialized foreign language vocabulary, reading of industry technical literature, and understanding of international standards and norms. The design of indicators should reflect the depth of

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students' mastery of cutting-edge topics such as clean energy technology, smart grid development and carbon emission policy. Attention is also paid to the degree of integration of interdisciplinary knowledge, such as the ability to accurately interface power engineering terminology with foreign language expressions. The knowledge updating mechanism requires regular incorporation of emerging field dynamics, such as the hydrogen economy or the evolution of international rules in the carbon trading market. The evaluation process needs to test the flexibility of knowledge application to avoid the detachment of theory from practice caused by static assessment [6].

Skill Dimension: The mechanism focuses on assessing the effectiveness of students' use of language tools in real-life situations, including technical document translation, international project negotiation, cross-border collaboration and communication, and other scenario-based skills. Indicator construction emphasizes the ability to convert jargon on the spot and the standardization of writing industry reports, such as the local adaptation of power equipment specifications or the feasibility analysis of overseas projects. Hearing and speaking skills assessment needs to simulate high-pressure environments such as cross-border video conference and on-site equipment debugging guidance to test the quality of instant information processing. Skill development tracking needs to be combined with feedback from internships to capture students' practical progress in tasks such as overseas power plant operation and maintenance and Belt and Road project docking.

Competency Dimension: The evaluation process focuses on the composite ability of talents to cope with complex challenges, with emphasis on observing non-programmed competencies such as mediation of cross-cultural conflicts, multinational teamwork, and handling of unexpected risks. Indicator design should quantitatively analyze the effectiveness of students' negotiation strategies in international engineering disputes or the sensitivity of risk identification in cross-border technology transfer contracts. Dynamic tracking should reflect the ability to adapt to different country work modes, such as adapting to the negotiation of EU environmental regulations and the differentiated strategy of infrastructure project management in Southeast Asia. Capability validation needs to record the logical rigor of on-the-spot decision-making by simulating high-pressure scenarios such as debates at UN climate summits and seminars on international standard revisions.

Literacy Dimension: The design of the indicators deeply integrates the special ethical requirements of the energy and power industry, focusing on the awareness of green responsibility, cultural inclusiveness and international cooperation ethics. The assessment of literacy needs to capture the integrity of students' performance in multinational projects, such as the adjustment of engineering programs to respect religious taboos or the transparency in disclosing environmental data. The cultural dimension assesses sensitivity to the customs of countries along the Belt and Road, as reflected in the localization of technical training materials or the optimization of project scheduling for religious holidays. The professionalism observation point includes the alertness to deal with the potential risks of technology leakage, the initiative to participate in carbon neutral initiatives, and other concrete behaviors, which are dynamically verified through overseas customer satisfaction surveys [7].

5.2 Selecting Diverse Evaluation Methods

Examination Evaluation : The evaluation mechanism is designed as a standardized testing tool, focusing on testing students' systematic mastery of energy and power terminology, including the ability to quickly decode materials such as nuclear energy safety regulations and smart grid technical documents. The content of the test questions needs to be dynamically integrated into the latest international standards of the industry, such as renewable energy grid connection specifications or carbon emissions trading thesaurus updates. The assessment format breaks away from the traditional closed-book model and introduces a scenario-based time-limited translation task to simulate the pressure of document processing when bidding for overseas projects. The analysis of results focuses on revealing knowledge blind spots rather than simple ranking of scores, providing precise coordinates for subsequent teaching interventions.

Assignment Evaluation: Teachers design modular tasks based on real cases in the industry, such as the localization of English manuals for thermal power plant equipment or the writing of environmental assessment reports for international projects. The evaluation focuses on the professional consistency of terminology, the objectivity and rigor of technical descriptions, and pays special attention to the correspondence logic between drawing labels and text descriptions. Assignments are graded in multiple feedback loops, with specific improvement paths for each cultural adaptation deficiency marked for complex tasks such as writing cross-border contract clauses. Student work files continuously track the evolution of terminology application skills, forming a personalized growth chart.

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Project Evaluation: Student teams are required to complete cross-cycle industry projects, such as the design of a simulated ASEAN power grid negotiation program or the compilation of a risk management manual for an overseas wind power EPC project. The evaluation body integrates corporate mentors and language experts to assess the process from three dimensions: technical feasibility, cross-cultural communication, and risk planning. The project evaluation pays special attention to the logical loopholes in the conversion of multinational standards, such as the ambiguities in the presentation of IEC standards when embedding them into the local regulatory framework. The acceptance of the results includes a blind review by a third-party organization, which focuses on verifying the ready-to-use value of the technical documents in real work scenarios.

Practical Evaluation : The internship base assessment records students' actual performance at cross-border engineering sites, including core scenarios such as the clarity of instructions in bilingual guidance for equipment installation and the efficiency of terminology translation in foreign labor training. The evaluation form is designed with key behavioral observations, such as cross-cultural negotiation strategies when dealing with conflicting versions of drawings, or the quality of immediate notification to the international team in the case of an unexpected power outage. Corporate supervisors regularly fill out dynamic competency matrices to compare the growth curves of students' differentiated coping skills when dealing with EU environmental verification and Middle East project acceptance [8].

5.3 Establishing Diversified Evaluation Subjects

Teacher Evaluation: Professional teachers design structured observation scales based on industry backgrounds to record the precision and quality of terminology application and adaptability of students in scenarios such as simulated international bidding and negotiation. The evaluation focuses on capturing logical breaks or cultural metaphorical misinterpretations during technical presentations, such as deviations in the translation of key concepts in the explanation of nuclear power safety regulations. The faculty team regularly compares casebook data from previous years to identify the evolving characteristics of students' competencies when dealing with ASEAN Grid Collaboration projects. Industry teachers pay special attention to regulatory adaptation blind spots in the localization of technical documents, forming targeted recommendations for instructional interventions.

Student Self-evaluation: Learners use a digital reflection tool to regularly scan the knowledge map and benchmark against three dimensions for tasks such as writing commissioning reports for overseas power plants: terminological rigor, efficacy in avoiding cultural taboos, and responsiveness to technical specification iterations. The self-assessment system guides the establishment of a dynamic capability axis, clearly labeling the room for strategic improvement when handling cross-border contract disputes. Reflective diary requires a concrete description of the causes of communication barriers in the simulation of EU environmental verification and cross-validation with the feedback from corporate mentors. The growth profile automatically generates a fluctuation curve to stimulate the internal mechanism of continuous improvement.

Peer Evaluation: Promotes peer exchange/cooperation, teamwork, and evaluation skills. Students evaluate peers based on the indicator system, offering suggestions. Methods: group/class peer reviews.

Social Evaluation: Corporate supervisors collect hands-on data at cross-border engineering sites to quantitatively analyze the frequency of instruction failures when students handle bilingual instruction on equipment. Industry Mentor Alliance establishes a shared evaluation library to compare the stability performance of terminology conversion in different country-specific project environments. Overseas customer satisfaction surveys focus on cultural adaptation details, such as the effectiveness of communication strategies for religious holiday scheduling adjustments. A third-party organization simulates international arbitration scenarios to verify the maturity of students' proof logic when dealing with technical standard disputes.

5.4 Strengthening Evaluation Feedback and Adjustment

Provide Timely Feedback: Communicate results promptly to help talents understand performance and identify improvement areas. Use diverse channels: written (reports, transcripts), oral (in-class, individual meetings), online (platforms, email).

Adjust Based on Feedback: Teachers analyze evaluation results to identify teaching shortcomings and adjust strategies/methods accordingly. Talents reflect on their learning process/methods and adjust their plans based on feedback.

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Establish Evaluation Archives: Maintain an archive for each talent, recording evaluation results and growth trajectory. This serves as a basis for awards, recommendations, employment, and informs institutional teaching management and reform.

6. Conclusion

This paper, from the perspective of new quality productive forces, explores the construction of a multi-dimensional dynamic evaluation mechanism for foreign language talents in energy and power universities. By constructing a scientific indicator system, selecting diverse evaluation methods, establishing multi-faceted evaluation subjects, and strengthening feedback and adjustment, the proposed mechanism provides a valuable reference for the cultivation and evaluation of foreign language talents in such institutions.

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