

Research on the Evaluation of Key Ability of Application-oriented Talents in Local Universities and Colleges based on Establishing Emerging Engineering Education

Jin Feng ^a, Shudao Wang, Huali Guo, Hongwang Zhao

Guilin University of Aerospace Technology, Guilin 541004, China

^a183622644@qq.com

Abstract. Shaping the key ability of applied talents adapting to regional social and economic development is an important goal of talent training reform in local universities and colleges under the background of new engineering. Local universities and colleges should be guided by social needs and identify the key abilities of talents adapted to local economic development. Only by establishing an evaluation system and evaluating reasonably can we constantly revise the training plan, improve the quality of personnel training and meet the needs of social and economic development.

Keywords: local universities and colleges; application-oriented; key ability; evaluation.

1. Introduction

The establishment of emerging engineering education requires local universities and colleges to serve local economic and social development, train engineering and technical applied talents, and provide practical technology development for industrial restructuring and upgrading [1]. The cultivation of key ability of engineering and technical personnel is an important goal of the teaching of specialized courses in local universities and colleges [2]. Only by making a reasonable evaluation of the trained talents can we revise the training mode and the training plan and make continuous improvement and progress. In recent years, with the promotion of international engineering education, local universities and colleges have begun to establish an evaluation system based on the professional competence of graduates, which provides new ideas for the training of engineering and technical personnel.

2. The Ability Identification of Applied Talents in Local Universities and Colleges

Local universities and colleges train engineering and technical personnel facing the front line. The development of new industry has changed its ability demand greatly. It emphasizes the collaborative innovation and wide application of information technology and Internet technology, and takes the two-way integration of Internet and manufacturing technology as the driving force to promote the development of manufacturing industry towards informatization, intellectualization and networking [3]. The key abilities of engineering talents must be embodied in solving complex engineering problems, multi-disciplinary integration and innovation, learning ability of sustainable development, organizational communication and internationalization ability.

2.1 Ability to Solve Complex Engineering Problems

According to the definition of complex engineering problems in the Washington Agreement, the applied talents in local universities and colleges should first possess solid professional knowledge, be able to use professional knowledge to analyze problems, plan solutions to problems with engineering thinking, and use engineering means reasonably and efficiently. Taking the process of industrial product development, design and manufacture as an example, it can be divided into design ability, matching calculation and checking ability, structure design ability, engineering draft ability, simulation ability, test ability, data analysis ability, process design ability, process control ability and logistics information flow planning ability. In order to achieve the goal, we need to apply the application of key technologies such as engineering principles and in-depth analysis.

2.2 Multidisciplinary Integration and Innovation Ability

A prominent feature of the new industry is the integration and collaborative innovation of information technology, Internet technology and traditional industries. In addition to the integration of disciplines, it should also have the thinking of the whole life cycle of sustainable development, scientific ecological concept and security risk awareness. It is necessary to solve complex engineering problems in this field from the perspective of social and economic development. In addition to grasping the basic knowledge of the subject, the cultivation of Applied Talents in local universities and colleges also needs to promote and integrate relevant disciplines to form innovative ability.

2.3 Learning Ability for Sustainable Development

Under the guidance of the new revolution of science and technology and industry, the economy of the world is developing vigorously. New formats, new technologies and new models emerge in endlessly. Knowledge, methods and products are constantly updated. Engineering and technical personnel must have the awareness of lifelong learning and the ability to track technological development in order to meet the needs of the developing social economy for talents.

2.4 Ability to Organize Communication and Internationalization

At present, industrial products show a trend of complexity and rapid iteration, so the process of product realization must be social division of labor in order to meet production needs. At the same time, the continuous mining and upgrading of product value chain makes the realization process of industrial products or projects must be a systematic project. Each individual involved in the process must rely on the help of others to realize its value, and each individual must carry out an organic organization in order to form a synergy without going astray. At the same time, due to the development of information technology and economic globalization, in order to become bigger and stronger, every stage of product realization can not be separated from international participation. Therefore, engineers and technicians must have an international vision and ability in order to achieve win-win in the process of economic globalization.

3. Evaluation System of Key Abilities of Applied Talents in Local Universities and Colleges

3.1 Current Situation and Problems of Traditional Evaluation Methods

The evaluation method is single. Local universities and colleges also mainly adopt curriculum assessment to evaluate students. Its basic characteristic is to continue the middle school examination method, biasing towards the assessment of students' theoretical knowledge. Its evaluation results are not applicable to the current standards for training talents. And there are some drawbacks, such as students' lack of purpose and initiative in classroom learning, temporary embrace of Buddhism after the end of the semester, rote memorization can also get high scores, there is a phenomenon of high scores and low energy; forced memory content is not in-depth thinking, easy to forget; theoretical knowledge does not know how to transform into productivity, can not. Learn to apply, etc. At the same time, the traditional examination evaluation methods often simplify a lot of conditions, and there is a certain gap with the actual situation. Especially for highly engineering courses, the existing examination methods can hardly reflect the ability of students to apply professional knowledge to solve complex engineering problems. Moreover, it can not evaluate the ability of multidisciplinary integration and innovation, learning ability of sustainable development, organizational communication and internationalization, etc.[4]

3.2 Establishment of Critical Capability Evaluation System

3.2.1 Principle of Evaluation.

Based on the concept of OBE engineering education, the construction of students' evaluation system should regard ability training as the specific goal of "learning output" and highlight the basic

characteristics of Applied Talents in local universities and colleges. Training engineering and technical personnel for regional economic development. Specifically, it is to train engineering and technical personnel with professional ability, guided by regional economic and industrial needs and aimed at graduates' ability to find jobs.

3.2.2 Establishment of Evaluation System

According to the above evaluation principles, the cultivation of key competencies of Applied Talents in local universities and colleges includes four aspects: the ability to solve complex engineering problems, the ability of multi-disciplinary integration and innovation, the learning ability of sustainable development, the ability of organizational communication and internationalization. The key competence evaluation system can be used as a first-level indicator. As mentioned earlier, there is usually more than one component of critical competence, which is further subdivided into two levels to construct the secondary indicators of the evaluation system, as shown in Table 1.

Table 1. Evaluation System of Key Ability

Primary index	Primary index weight	Secondary index	Secondary index weight
Ability to Solve Complex Engineering Problems	A1	professional knowledge	A11
		Engineering thinking	A12
		Analysis and solution	A13
		Engineering means	A14
		Efficiency and quality of work	A15
Multidisciplinary Integration and Innovation Ability	A2	Multidisciplinary integration ability	A21
		Scientific ecological view	A22
		Innovation ability	A23
		Innovative achievements	A24
Learning Ability for Sustainable Development	A3	Learning consciousness	A31
		Learning method	A32
		learning ability	A33
Organization Communication and Internationalization	A4	Organization skills	A41
		Team working	A42
		Communication skills	A43
		Language and reporting	A44

3.2.3 Evaluation Form

To reasonably reflect the key abilities of the assessed, evaluation should run through the whole learning process. Teachers have a good ability to evaluate the knowledge, thinking, methods, means and results displayed in the results report, while students have a better understanding of the related abilities displayed in the process of teaching assessment. Therefore, the assessment process of curriculum learning should adopt the methods of teacher evaluation, student self-evaluation and group mutual evaluation. At the same time, the weights in the evaluation system should also be different because of the different evaluation subjects.

4. The Implementation of Ability Assessment in Professional Courses

Ability evaluation pays attention to the whole teaching process. Conventional teaching and assessment are difficult to meet the evaluation requirements. It is necessary to reform the teaching evaluation methods. Project-based teaching and assessment is a teaching mode, which condenses the practical problems of employment into a project, drives students to be the main body of teaching, and trains them in solving complex engineering problems, multi-disciplinary integration and innovation, and sustainable development in the course of completing the project. Learning ability, organizational communication and internationalization ability.

In addition, the evaluation system of key ability has high requirements for teachers' engineering practice ability and organizational management ability. Only professional teachers themselves have strong engineering practice ability and relevant work experience of enterprises, and often pay attention to the development of the industry, can they select reasonable topics in teaching and assessment, cover all the training needs of key competencies, objectively evaluate the results, and meet the specific practical requirements of enterprises.

5. Summary

The construction of identification and evaluation index system of key ability of Applied Talents in local universities and colleges provides a basis for the evaluation of students' key ability. Only when the evaluation is more objective and meets the needs of service objects, can local universities and colleges constantly revise the training plan, improve the training means, improve the training quality and meet the needs of regional socio-economic development. At the same time, it also enables students to fully and correctly understand themselves and constantly achieve self-improvement.

Acknowledgments

This work is carried out with the support of the research project of teaching reform of Vocational Education in Guangxi in 2018. (Exploration and Practice of Training Mode for Vehicle Engineering Professionals in Local Colleges Universities under the Construction Background of Emerging Engineering Education) (NO.2018JGZ148).

References

- [1]. Xia Jianguo, Zhao Jun. On the Reform and Development of Engineering Education in Local Universities and Colleges Based on Establishing Emerging Engineering Education[J]. *Research in Higher Education of Engineering*, 2017(3): 10-15.
- [2]. Gong Xinhe, ZHU Weiwen. Capacity Building: A New Thought for Personnel Training in Continuing Engineering Education[J]. *Adult Education*, 2019(2):68-72.
- [3]. Shi Xiaoqiu, Zhao Yan, Li Xiaokun. The Thought of Constructing an Integration, Open and Self-adaptive System of Emergent Engineering Education for Local Universities[J]. *Research in Higher Education of Engineering*, 2017(4):10-15.
- [4]. Feng Jin. Exploration on the Construction of the Second Classroom of Vehicle Engineering Specialty under the Construction Background of Emerging Engineering Education[J]. *Education Circle*, 2019(15):119-120.