

Cultivating excellent metallurgical engineer leadership Training

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Abstract: In view of the current higher education in metallurgical engineering outstanding engineers plan "in their respective areas of high level experts and the industry enterprise leader" training in schools, government, enterprises must take the appropriate role of the necessity of training, analysis of the current domestic and foreign to the engineer of the future leadership training target, mode, mode, expounds the relationship between government and enterprise, metallurgical engineer school future leadership training in the training plan, combined with excellent metallurgical engineering specialty in our college for training, leadership ability, teachers, curriculum system optimization combination mode, exam reform, mode are introduced.

Introduction

In 2010, China launched the "Excellence Engineer education program" (hereinafter referred to as the "excellence"), the standard in the macroscopic level of outstanding engineers all walks of various types of training and puts forward the basic requirements, the proposed guidance to participate in training the excellent engineers plan, and to guide the participation of excellence program in Colleges and universities the government, enterprises and put forward specific and clear task. The implementation of excellent plan to follow the "guidance for industry, school enterprise cooperation, the implementation of classification, in various forms, the pursuit of excellence" principle. Industry enterprises are involved in excellence program subject and the premise condition, is the key to excellence program successfully, this will require the enterprises and the close cooperation in the whole process of training, also requires education administrative departments at all levels of government to formulate corresponding policies and regulations to support the smooth implementation of the program of ^[1] excellence.

The specialized theory knowledge of excellence plan training "in their respective areas of high level experts and the industry enterprise leader" ^[1] should not only have high level, but also have to participate in the production practice as the representative of the engineering practice skills, leadership is the key to leading the key factor, which is the Future Engineer essential basic skills great attention must be paid, and focus on training.

Based on the excellent professional engineer University of Science and Technology Liaoning metallurgical engineering practice as example, discusses the culture in the excellent engineers, the excellent engineer leadership integrant part, training mode, (high) School Administration (Fu) enterprises (industry) to carry out studies of the relationship between, in order to coordinate the

cooperation Universities, government, enterprises to participate in the program of excellence provide reference.

1. A leadership of excellent engineer

1.1Concept of leadership

Leadership means that the person has attracted in the specific situation and effect of group or organization members and stakeholders, the play in the process of realizing the target of a group or organization ability and the influence of [2]. Metallurgical Engineer excellence leadership refers to a metallurgical engineer in solving the sophisticated technology problems of this field at the same time, also should have led the team members to solve technical problems when the enterprise organization and coordination of the various forces leading role as a link in the.

1.2 leadership characteristics

(1) Non-innate

Leadership is not innate, is able to undergo mining and culture. So excellence plan should strengthen leadership training, should according to each different individual characteristics of mining culture, to meet the different levels of leadership requirements.

(2) No relationship of his leader role

Whether a person in positions of leadership and leadership is it doesn't matter, leadership is a personal quality, all personnel involved in the various levels and types of a group or organization in need, but the focus, the specific requirements of degree.

(3)Combination with other factors

Leadership is the needs of a variety of factors closely related with industry expertise, local policies and regulations binding function. Good habits so should develop the relevant laws and regulations, local economic development of the industry, and advanced technology of the industry and the typical project case.

(4)Practical skills be emphasized

We must strengthen the enterprise from the bottom of the production department to gradually improve the culture environment, need training must be, pray not to read a book, through self-study exam training mode theory such as single link, must be combined with business types, characteristics of the project, the enterprise culture, regional characteristics, policies and regulations, economic conditions, technical conditions and a series of constraints to be training.

(5)Strong subjectivity

To give full play to the role of personal charm in the infection group, and this effect requires some occasions, platform support, so training should also differ from man to man, not make it rigidly uniform pattern and method.

1.3 Functions of leadership

The common value orientation to lead the group or organization members believe in group identity or the organization's mission, vision and objectives as well as members of the. Be good at communication and coordination, the establishment of mutual respect and mutual trust relationships with others, good. Master the methods and means of effective way, certain, and fully mobilize the enthusiasm of others, be willing to work together to fulfill the objectives of a group or organization and make unremitting efforts for [2].

In the excellent engineer education, subject of colleges is to carry out personnel training; enterprise timely put forward the demand for talent, is to guide the colleges and universities to develop, adjust the training plan and training mode key; the government should actively research innovation and development under the new situation should formulate laws and regulations, to

break through the traditional thinking, emancipating the mind, release the innovation vigor, actively provide training platform.

1.4 Training

The proposed training plan of excellent engineer different leadership, such as America "engineering University of Michigan global leadership Honors Program", America Penn State University "project leadership development minor program", "Gordon-MIT America Massachusetts Institute of Technology Engineering Leadership Program", the Royal Academy of Engineering "undergraduate engineering leadership Advanced Award", the University of Toronto "future leaders", Monash University in Australia "technology environment Leadership Program" etc.. According to the national conditions, regional characteristics, economic status and School of professional features, services and other factors, the training pattern conforms to the characteristics of the University, such as USA University of Michigan key to cultivate "cross-cultural national environment leadership"; Penn State University through class discussion, international travel, situational learning combined with the mode of training the student leadership; Massachusetts Institute of Technology of the project is to provide learning and achievement oriented leadership training base based on the school, for all engineering majors; the Royal Academy of engineering to the annual training, social weekend, arrange, at home and abroad engineering practice, visit the project, attended the meeting and other components [2].

2. Leadership needs of excellent engineer

As the name implies, the training goal of Excellence Engineer is carried out in the future in the field of Engineering invention, engineering innovation and engineering practice, leader, with "collar" from many branches of the personnel of the "army", to a specific goal to carry out research and development work, and can not "lead" the key lies in the other the military figures lead levels, namely leadership.

From the perspective of development, excellent engineer leadership has the following requirements:

2.1 Social development needs of their own

(1) Enhance the competitiveness of talent in the employment

As a comprehensive modern enterprise production, the technology staff's comprehensive knowledge and skill requirements are also improved, and organize the professional staff of unity and cooperation to solve the technical problem in the process of production capacity and material, equipment, personnel, funds, coordination, public relations, resources, enterprise culture, advanced management knowledge and other non technical factors ability is a very important factor, while the traditional higher education to the ability to solve technical problems training more attention, and cultivate the ability of the non technological factors do not pay enough attention, is also trained a large number of so-called "EQ" below "IQ" talent, and the ability of the non technology factors strong has certain leadership of the graduates, employment competitiveness greatly enhanced.

(2) Enhance the competitiveness of enterprises in market

The competitiveness in the market in addition to the product quality excellent, good management team is an important factor in the success of. The quality of the products, the competitiveness of products of input output and production processes than close, in the product from the production to the after sale service in every link, good operation and management in the moment of impact, and it is also an important part of enterprise competitiveness. The past "good wine is not afraid of deep alley" age has gone for ever.

(3) Promote the enterprise internationalization

Internationalization is the dream of every corporation, is a wonderful vision each metallurgical enterprises. Today's science and technology popularization of knowledge is far greater than the speed of development, and emphasizes the coordination management ability, leadership training, can maximize manpower, resources, propaganda way efficiency to adapt to the internationalization of talents demand.

(4) Promote enterprise independent research and development, scientific and technological capacity
 Excellent engineers in the process of cultivation, widely participate in enterprise production, R & D, management link, after graduation in the independent research and development of enterprises and scientific research, is relatively common in metallurgical engineering graduates, has obvious advantages.

2.2 requires excellent engineer's quality

Master the ability to choose the appropriate method of theory and practice to solve the practical engineering problems, and experienced design, production operation system operation and maintenance and solve the practical engineering problems of systematic training. The concrete can be shown in the:

(1)Design capacity of 1 participating in the scheme of enterprise project

Understanding of the latest achievements and changes in the market, the needs of the users and the technology development, to develop support for forming process of product planning and improvement scheme; in consideration of cost, quality, environmental protection, safety, reliability, adaptability, the shape and the impact on the environment, from design, development, evaluation and selection of technology, find out, process and methods needed to complete the project, determine the solution; the preliminary ability has a strong sense of innovation and product development and design, technical transformation and innovation.

(2) participate in project implementation and project management skills

In the laws and regulations of the scope of work, according to the relevant standard and procedural requirements; management plan and budget, organization, manpower and resources; and the incident has the ability to take appropriate action; participate in the evaluation of the project, put forward the improvement proposal.

(3) effective communication and interpersonal skills

With the technical language, communication and expression in cross culture environment; the compilation of project document, have the team spirit of cooperation, coordination, management and have the preliminary ability, competition and cooperation in a certain.

(4) have good occupation moral

The occupation, social, environmental responsibility, abide by the occupation of the occupation system conduct and occupation moral; strong sense of responsibility, good quality, safety, service and the awareness of environmental protection; to develop and implement the continuing occupation development plan.

3. Establishing scientific and reasonable training mode

As for the Colonel government to leadership development role, different countries system, is a variety of. But they are cultivated in the enterprises to participate in the training condition, the current situation of the development of local service in metallurgical enterprises school basis, combined with the professional setting, formulate a scientific training plan; the government's role in it, with the national government in national economic development status and the appropriate choice, such as America government is keen to provide a platform, UK the government emphasizes

to guide enterprises, government and university cooperation, release the innovation vigor, the leading role of the Japanese government is more strong. Since our country is long-term planned economy system, the goal and the way engineers showed obvious government advocacy, the status of enterprises to follow the trend of University, the University, the lack of professional characteristics, students are lack of independent thinking and problem solving skills [3]. Governments at all levels for the cultivation of outstanding engineers in the leadership level, the relative technical ability is not enough attention, should be paid more attention to, especially the introduction of some guiding, encouraging policies and regulations, promote the implementation of each part in the leadership training.

Excellence is the cradle of cultivating future engineer, the engineer of the future level of leadership to lay the foundation in the learning phase, the school should be present in the policy guidance, to the enterprise demand, timely adjust the training plan, training with the future enterprise to carry out the production needs of talent, the talent has superb professional knowledge and skills, but also must have excellent leadership.

3.1 Characteristics of school enterprise cooperation training excellent engineer leadership

(1) Organizational innovation

Is refers to the enterprise incubator, University established by the government and active according to the entrepreneurial university, establishing demand and government coordination and cooperation to establish three joint research center belong to organizational innovation. Because the three are independent institutions, independently assume outstanding engineers are thin and weak, and through the organization innovation can combine the three, with the students' selective learning, purpose of training technical personnel meeting the needs of the enterprises, but also need the organizational innovation leadership training. Enterprises according to their own development needs, active and school, strengthen the training of [4] what leadership requires schools like "order", and actively to the government proposal, suggested that the introduction of some encouragement or advocacy regulations, for example, can organize students to visit the production process, and introduces the production of raw materials, quality standard, production period, before and after the procedure, management mode, personnel composition, post ability demand non technology factors, allow students to combine classroom learning knowledge, understand the importance of leadership factors and the links of production needs.

(2) Loose coupling

The equal status university, government, enterprises to participate in the program of excellence between, does not exist on the lower level between the leadership and the leadership, command and obedience relationship does not exist, which requires their identity right, in the coherent case, try to do your own affairs, complete the implementation program of excellence. Leadership requires more coordination, loose platform between the enterprise, University, government needs maintenance and coordination, more need to support each other, especially the government in tax, research funding, projects and other aspects of support.

(3) Symbiotic win-win

Excellence is a big issue about the country's future development, governments at all levels attach great importance, not only conforms to the national strategy of talent powerful nation, but also with the local government to local economic development; enterprise's survival, development, strong mostly need excellent engineer support, and technical personnel of the level of leadership in the enterprise shows management, organization, coordination ability of enterprise development is the precious wealth, the single has high technical ability "will" is important, and those with higher level

of leadership "will" become the need of innovative development of enterprises "handsome" is more precious, they not only solve the technical problem expert, is good at planning master the coordination and management; school students have to play to their strengths to create stage, in line with the school survival and development characteristics, for the future development of reference.

(4) Talent exchange

The school personnel training as the main force, teaching is its main business, the traditional teaching to "preach, teach, doubts" for oneself, emphasize the cultivation of students' professional quality, communication, coordination, organization, management as the representative of the leadership has not aroused enough attention. But the traditional teaching teachers are lack of practical skills, to theory teaching, experiment class as the representative of the teaching mode, can satisfy the need for early engineer, because at that time under the planned economic system of the management responsibilities by all levels of management personnel to complete, from the leadership to complete, at that time the leader has the absolute authority, technical personnel do not have to worry about making mistakes bring the problem. In today's market economy, enterprises have the right to decide the product structure and the types of their own, can develop new products to meet the needs of the market, and this is done by the do not understand the professional technology leadership cannot, so leadership ability is essential for every engineer of the future, it is a short board of the traditional teacher, need guided by the government at all levels of staff at the organization management, the production experience to teach. So, in the government's policy guidance, enterprise technical staff and teachers work, complement each other, more cooperation training activity.

3.2 Model of school enterprise cooperation training excellent engineer leadership

In the training mode, the era of the planned economy is the government responsible for the guidance of university students, responsible for training, selection of enterprises; after the reform and opening up policy, government guidance has been weakened, university can be partially independent recruitment, training objectives and modes can be chosen properly, enterprises and graduates to carry out double employment, which has laid the enterprise talents market demand the adjusting training plan based, government regulation only as the talent cultivation and standardization of the professional name of the catalogue for the guidance, schools can to keep our specialty or meet the region, the industry market demand adjust [5].

Outstanding engineers plans, is hosted on the administrative departments of education of China under the guidance of the grand project, training objectives for the future engineer drawing, but also a significant measure to promote the engineering education power toward engineering education in China, aims to train a large number of innovation ability, adapt to the technical personnel of various types of engineering high quality requirements of economic and social development, as the national new industrialization road, building an innovation oriented country and talent strategy, to promote higher education facing social demand of personnel training, and comprehensively improve the education of engineering talent training quality has the very important function of demonstration and guidance [6].

4. Our school of metallurgical engineering professional success

"Excellence Engineer education program" by the college and enterprise joint cultivation mode, the engineers into school and enterprise learning two training stage. Requirements and education campus school, each school according to the general standards and industry standards to develop. Enterprise learning stage, undergraduate training to a total of 1 years in the enterprise learning and doing graduate design.

In the learning stage is "the key of excellent engineer education program" success or failure. Participate in the "plan" Excellence Engineer education colleges and enterprises, to build learning during the training target, training standard and the corresponding system in the enterprise, advanced technology, learning the advanced equipment and advanced enterprise culture. To develop "enterprise training program", and refined to each week learning arrangements. The realization process mainly include:

(1) Optimization of curriculum system. The main is to adhere to the "project oriented, wide base, strong ability, application, school enterprise cooperation", pay attention to the basic disciplines and prominent professional features, such as the basic subject of broadening students learning can enable students to lay the future non technical course, highlight the professional characteristics are closely combined with the recent development of Metallurgical Engineering elective courses, with strong professional guide. In our school of Metallurgical Engineering Excellence Engineer training plan, the public basic course "Introduction to engineering" course increases, increases the "university physics" and "school physical experiment" innovation experiment proportion; increase the engineering application of "legal practice, industrial engineering and management" courses in basic courses; professional courses in the adjustment of the "teaching of metallurgical physical chemistry, metallurgy, metallurgy II", increase the enterprise tutorial Courses "modern metallurgical engineering design principle, technical and economic analysis", opened a comprehensive experimental courses, also increased by the management cadre speaker industry management course "marketing, financial management, quality management" and other professional courses, the government guidance and planning, enterprise project needs and organization, school teaching and harmonious benign cooperation mode.

(2) Optimization of teachers. The introduction of school and enterprise mentors combination of talent training pattern. The school teacher, strengthen the training of enterprise knowledge literacy, such as through the practice in enterprises, health, culture, industry of double qualified teachers. The school according to the metallurgical engineering specialty in our college history origin, development, regional service, professional characteristics and the actual circumstances, characteristics and expert on the metallurgical enterprises of special domain analysis, hire full-time teacher qualification certificate issued by the education, teaching training business experts, its commitment to teach some professional courses and the practice teaching guidance teaching task; at the same time the school for the enterprise experts to conduct education training, improve the modern professional knowledge level of enterprise personnel, provide the support and guarantee for the excellence program development; also organized a large amount of young promising teachers, of the personal knowledge, subject characteristics, hobbies, organizations need etc. Analysis, corresponding to the enterprises involved in the project implementation, coordination and management and so on, strengthened the full-time teachers in the school leadership level, so as to better accomplish excellent metallurgical engineer training objectives training on leadership capacity plan.

The college to hire technical experts to guide students in scientific and technological activities, in accordance with the requirements of training scientific research content and project process management, promoting students' active use of the teaching resources of all kinds of education, promoting students' active learning, teamwork, project management and joint innovation. Invite industry experts, government management cadres to conduct lectures, reports, academic exchanges, to enable students to understand the development strategy of Engineering frontier, frontier, business majors and subjects from different sides.

(3) Strengthening the combination. Taking engineering as the main line, combining with the implementation of the project "research" and "do", to "study" the objective, and cultivate the organization and coordination and management ability, strengthening the cultivation of leadership. Our implementation of excellent engineers training, the introduction of finishing mill equipment of a metallurgical enterprise demonstration, installation, test, trial production sectors such as the organization of students learning, not only increases the interest and improve the teaching effect, and the students mastered the production practice a lot of textbooks can not learn demonstration, organization, installation is very practical skills. At the same time, the student's personal interest and social relations, organize students to participate in the part of the entire implementation process furnace reconstruction project of a iron making plant, although the problem of funds and equipment, lasted for a long time, but to enable students to experience the technical solution design and actual production, has many accidental factors need treatment, also experienced a "design -- -- -- experimental test production" close interaction, has received the good teaching effect, at the same time participating in the teachers' leadership ability has been improved accordingly. Also participated in the planning and implementation of cultural construction and promotion project of a metallurgical enterprise combining subjective sector organizations, government industry metallurgical enterprises leading, my students to participate fully in the.

(4) Pay attention to the assessment

The organization and management, strengthen the implementation of projects in the process of resource coordination, policy grasp evaluation knowledge. Pay attention to the basic theoretical knowledge into learning ability, analysis and problem solving ability, practical ability of combining examination, examination index of diversification, the comprehensive experimental skills test, comprehensive operation, research reports, papers as a supplement of the final exam, improve the effectiveness of the curriculum evaluation, training objectives to achieve excellence Engineer the. For example, examples of a rolling process transformation using pre collected, organize the students to the analysis, combined with the development of the industry fully discusses the necessity of reformation, technology feasibility problem, ask the students to different topics, complete the implementation of the project planning and design, at the same time for different students, set some accidental events as a condition, production design, have received a very good results; the test program performance organization students for a refractory material, and according to the time of the actual situation in the enterprise implementation of the scheme are set, students are required to complete the design and organization of the respondent, enrich the scheme, optimization of resource, lay the foundation for the future on the job. These links in the design, must consider the government advocated energy-saving, emission reduction, low consumption, frugality and on the surrounding environment, regional economy, industry leading enterprises close cooperation, the formation of "government, enterprise, school and Chang sing" pattern, the full enjoyment of the social aspects of the environment, to cultivate the students' level of leadership.

Summary

Go China characteristics of a new road to industrialization, the urgent need to cultivate a large number of able to adapt and supporting industrial development engineering talent [7]; building an innovation oriented country, improve project team of science and technology innovation ability of our country, the urgent need to train a large number of innovative engineering talents; strengthen the comprehensive national strength, to meet the challenge of economic globalization, the urgent need to cultivate a large number of the international competitiveness of the engineering talents.

These engineering talent leadership directly determines its can develop technical expertise, to maximize the creation of productive forces.

Higher engineering education to strengthen the active service industries and enterprises demand of national strategic needs, the active service consciousness, establish training concept to Germany first, emphasis on ability, the comprehensive development of talents, joint personnel training mechanism innovation of college and enterprise, talent cultivation mode of engineering education reform, enhance the ability, innovation ability and international competitiveness of engineering practice students, building layout is reasonable, the structure optimization, types, adapted to the modern higher engineering education system is the need of economic and social development, has Chinese characteristics, speeding up our powers to engineering education.

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