Research on Curriculum Content and Education Model of Soft Ability Training of Employment and Entrepreneurship for Graduates of Science and Engineering

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Abstract. Constructs employment and entrepreneurship ability model for graduates of science and engineering, analyzes present situation of soft ability and its training of graduates in science and engineering, studies the feasibility of building “soft ability training center” for employment and entrepreneurship training and setting up soft ability training course for graduates of science and engineering in colleges and universities, discusses teaching philosophy, teaching content, teaching methods, teaching mode and incentive mechanism of course construction, and then puts forward some countermeasures and suggestions for establishing cooperative program among industry, government, enterprises and universities and basic platform, so as to enhance training effect of “soft ability” of employment and entrepreneurship for graduate Students of science and engineering.

Introduction

Article IX of Some Opinions on Improving the Quality of Higher Education issued by Ministry of Education (Higher education [2012] No. 4) proposed that colleges and universities should formulate basic requirements of teaching for innovation and entrepreneurship education, and develop curriculums for innovation and entrepreneurship. That is to say, to carry out teacher training vigorously for innovation and entrepreneurship to support college students on innovation and entrepreneurship training, to establish education guidance center in colleges and universities generally for innovation and entrepreneurship training, to improve curriculum system for career development and employment guidance so as to strengthen innovation and entrepreneurship education and employment guidance services. These new opinions put forward new requirements on setting up and developing “soft ability” training courses for employment and entrepreneurship of graduates, and improving graduates’ ability of employment and entrepreneurship.

At present, incapacity of “soft ability” became weakness of graduates of science and engineering. It not only constraints success of graduates of science and engineering to achieve employment and entrepreneurship, but also has become a bottleneck to their growth and development. Therefore, putting soft ability training into ability training system of graduates is not only needs of social development, but also the needs of reform and development for higher education.

Ability Model of Employment and Entrepreneurship for Graduates

Famous American psychologist D.C. McClelland put forward a well-known iceberg model for capability and quality in 1973, was a pioneer of ability model research. Abilities and qualities include 6 parts, that is ①knowledge, ②technique, ③social role, ④self-concept, including attitude, sense of worth and self-image, ⑤personal characteristics and ⑥motives.
Through interview method and the experience summary method, it is reckoned that ability model of employment and entrepreneurship for graduates of science and engineering includes the hard ability of professional knowledge and skills, and the soft ability of 6 aspects, including teamwork, innovation, communication, organization and leadership, ideological morality, humanistic accomplishment. The combination of all hard and soft abilities form ability diamond model of employment and entrepreneurship for graduates of science and engineering. Among them, teamwork ability is an ability of working harmoniously in a team, and playing their greatest potential and helping team to achieve overall optimal; communication skills is an ability of good at listening, willing to communicate, communicating effectively among people and solving all kinds of contradictory; innovative spirit is the ability to put forward new ideas and methods after comprehensive use of existing knowledge, information, skills and methods, and is will, confidence, courage and wisdom to invent, reform and innovate; organization and leadership is the ability to allocate resources according to the task, while control, stimulate and coordinate the process of group activities, so as to integrate with each other to achieve the goal of organization. Ideology and morality refer to ideology and behavioral character, including ideological and behavioral qualities consistent with the socialist ideology; humanistic literacy refers to basic qualities and basic attitudes a person should have, including dealing with relationships properly between him and others, individual and collectives, individual and society, individual and the state, and even the relationship between individual and nature. Figure 1 show for details of the model.

![Ability model of employment and entrepreneurship.](image)

**Soft Ability Training Status of Employment and Entrepreneurship for Graduates**

A common issue in education of graduates of science and engineering is paying more attention on teaching knowledge and cultivation of professional skills as well as paying less attention on cultivation of soft ability. Although some universities established college of innovation and entrepreneurship, and there are training program for innovation and entrepreneurship, it usually lack of appropriate systematic curriculum support. Graduate education mostly stay in doing experiment, writing papers, publishing articles, which lead to graduates having more book knowledge and less innovative and entrepreneurial ability[1], to a certain extent, training of soft ability such as teamwork, innovation, communication, organization and leadership, humanities and so on is lack, training status of soft ability is not satisfactory.

Firstly, team collaboration ability should be further improved. Although the process of employment and entrepreneurship has embodied the spirit of teamwork, the depth of team collaboration is not enough. In completion of project process, the collaboration and division among team members is simple, lacking of systematic operational programs and human resources integration capacity; Secondly, to a certain extent, graduates of science and engineering lack of language training,
psychological and behavioral scientific knowledge, it has affected their effective communication with others; Thirdly, at present, the employment of science and engineering graduate students tend to look for stable positions. Entrepreneurship is also lack of innovation. It mainly shows the lack of novelty in the choice of entrepreneurial projects, the narrow field of entrepreneurship and the single way of entrepreneurship. Therefore, the spirit of innovation, innovation consciousness and ability need to be improved[2]; Fourthly, leadership and management capacity and control capacity are generally weak. EQ in the aspects of emotion, will, mood and so on and its performance is obviously inadequate. Fifthly, the survey shows that colleges and universities which pay more attention to cultivation of humanistic spirit was on the proportion of 39.1%, not familiar with the concept of human spirit accounted for 49.5%, never participate in humanities and social science activities accounted for 21.7%, occasionally 64.3%[3], The data reflected the contemporary humanistic spirit construction in colleges and universities needs to be paid more attention.

Courses Set for “Soft Ability” Training of Science and Engineering Graduate

Feasibility of Creating “Soft Ability Training Center” and Soft Ability Training Course for Graduate Students in Science and Engineering

The survey interview found that most of the enterprises hope that colleges and universities set up training courses for employment, innovation and entrepreneurship in the training of graduate students in science and engineering, the content should focus on improving interpersonal communication and communication skills, strengthen teamwork and organizational management training, strengthen case studies, opportunities and environmental analysis, personalized counseling and so on. Enterprises mostly expressed support attitude on the “employment soft ability training center for college students” project. At the same time, the will of graduate students on the employment of soft ability training are intense.

At present, colleges and universities have set up college of entrepreneurship and innovation, to form an integrated employment and entrepreneurship, innovation and entrepreneurship education training platform along with original employment center for college students and practice training center, innovation and entrepreneurship training courses is also gradually established in the graduate training. Therefore, drawing on the training model of “student success center” and the training system of “soft ability training center” of social training institutions, it is feasible to set up the soft ability training course through integrating the soft training courses of universities, enterprises and social training institutions.

Teaching Concept of “Soft Ability” Training Course for Graduate Students of Science and Engineering

Using international accepted OBE education concept for practical talent training[4], aiming to training soft ability of students, create a sound soft ability curriculum system for graduate students of science and engineering. Based on the results of learning or result orientation, through the design of appropriate educational structure, place students in the educational environment which can develop their practical ability, to make them form high-level capabilities through completing complex tasks in a team, such as the ability to innovate, the ability to deal with and integrate information resources, the ability to organize and plan, so that students can achieve the desired results in the learning process.

Teaching Content of “Soft Ability” Training Course for Graduate Students in Science and Engineering

It is necessary to set up training courses for soft ability about interpersonal relationship and communication, lectures and eloquence, emotional stress management, time management, team management, decision management, negotiation skills, adolescent bilingual leadership training, innovative thinking, conference management, and so on[5].
Interpersonal relationship and communication includes 10 aspects of teaching content, including interpersonal cognition, interpersonal communication, verbal communication, text language communication, knowledge of nonverbal information, job search and entry communication, business communication skills, daily communication and listening, friends’ communication and cross-cultural communication. The lectures and eloquence mainly introduce the practical knowledge of lectures and eloquence, the writing methods of various speeches, the skills of professional eloquence such as lectures, debates, job seekers and so on. Through stressing humanistic, interactive, participatory and operational to make students master lectures and eloquence skills, improve oral expression, and develop a specific professional oral style and practitioner’s norms. Emotional stress management includes stress correct cognition, effective pressure management, pressure mitigation methods and techniques, emotion and interpersonal relationships, emotional regulation and management, organizational emotional management and other content. Time management includes the establishment of a clear time management objectives, the development of time management action plan, reasonable arrangements for working hours, applying time management skills and so on. Team management mainly includes goal management, process management, effective management, performance management, expected management and so on. The decision-making management includes decision-making theory, principle and basis of decision-making, decision-making type, decision-making procedure, decision-making method and so on. Negotiation skills include East-West negotiation thinking, strategic planning of the negotiations, cooperation negotiations for project, actual implementation of the negotiation technology and so on. Adolescent bilingual leadership training includes interpersonal goals set, leader speech training, empathy training, criticism and recommended skills training and so on. Innovative thinking course content includes brain physiology and psychological basis of innovative thinking, basic elements of innovative thinking, basic ability of innovative thinking, basic types and methods of innovative thinking, and so on. Conference management includes type of meetings, seven management elements of meetings, planning and marketing of business meetings, conference documents, preparation and management of meetings, conference industry and other teaching content.

**Teaching Methods of “Soft Ability” Training Course for Graduate Students**

Teaching methods should transform from traditional lecture, one-way model to diversified, two-way model, it should use case-based teaching system of international general experience, under guidance of teachers, from actual case gradually lead to content, from knowledge learning to ability learning.

**Teaching Mode of “Soft ability” Training Course for Graduate Students**

Adopting interactive task-based teaching mode, ensure the training effect of the “soft ability” course for graduate of science and engineering. Interactive mode is information exchange, activities, interaction and teaching interaction among teachers and students, students and students[6]. Interactive task-based teaching method refers to a series of specific activities in the teaching design. Through interaction in teaching and learning community, the learner and the trainer complete these activities through the use of relevant theory and skills. In the process of completing the task, achieve teaching purposes to get soft ability of employment and entrepreneurship.

**Incentive Mechanism of “Soft ability” Training for Graduate in Science and Engineering**

Employ soft ability training to training program for graduates of science and engineering, divide training course system into compulsory courses and elective courses, and occupy a certain percentage of credits, to cultivate “soft ability” comprehensively. Give higher pay for college teachers, enterprises and social teachers engaged in employment and entrepreneurship “soft ability” training of graduate of science and engineering, in order to stimulate commitment enthusiasm of teachers and faculty.
Recommendations for Enhancing Training Effect of “Soft ability” Training Course for Graduate Students of Science and Engineering

To Improve Teaching System of “Soft Ability” for Graduate Students in Science and Engineering

Under the guidance of teaching demand, according to the ability status and professional needs of postgraduates of science and engineering, set up targeted soft ability enhancement course according to the differences between men and women and the differences between science and engineering, through classroom teaching, seminars and other forms to open the knowledge of graduate students of science and engineering, expand their knowledge reserves and related skills to meet the needs of soft ability training.

To Establish a Cooperative Program among Industry, Government, Enterprises and Universities

Colleges and universities should establish a cooperative training program among industry, government, enterprises and universities based on “soft ability” training of the postgraduates of science and engineering, and integrate the educational resources in all directions, and introduce the personnel with rich theoretical basis and practical experience to enrich teaching staff, and send teachers to enterprises to sum up practical experience, and introduce enterprise management personnel to carry out various auxiliary lectures, build cooperation platform for education among industry, government, academics and research to reduce cognitive differences and capacity gap of employment capacity between universities and employers[7], effectively carry out “soft ability” training activities.

To Construct the Basic Platform for “Soft Ability” Training of Postgraduates of Science and Engineering

Integrate platform resources inside and outside the university, build education platform for socialist core values, education platform for Chinese outstanding traditional culture, network media communication platform, campus cultural activities platform, social practice platform to increase practice activities for “soft ability” cultivation and to tap the potential of science and engineering graduate students, to provide them opportunities to show themselves[8].

To Establish Good Incentive Mechanism and Hardware and Software Conditions

Under the background of “mass entrepreneurship and innovation”, the “soft ability” training is the need to build an innovation-oriented country in the long run. Therefore, colleges and universities should provide protection and support at the organizational level and system level. It should adhere to the various incentive mechanisms to enhance the “soft ability” of the postgraduates of science and engineering, and improve the various hardware and software support conditions[9].

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