

To Establish Sustainable Cooperative Partnership Between Enterprises and Universities

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Abstract:

Through the successful experience of Baosteel to establish sustainable cooperative partnership with universities both at home and abroad, the thesis exploits objective requirements, main contents, eight patterns and five experiences for the cooperation between both parties.

Key words:

Enterprise and university, Cooperative partnership, Talents training

Talent resource is the most important strategic resource, moreover talent is the decisive element of the enterprise development in the enterprise competition. The rise of Baosteel relies on the constant technical progress and sustainable innovation, while the key is talent. Since the establishment of the company, Baosteel attaches great importance to talents. In the course of producing steel of superior quality and expand its scale, Baosteel has cultivated a great number of talents, accumulating a wealth of talent resource, setting a solid foundation for the sustainable development, and forming a training system characterized by both self training and partly depending on social educational training resource. One main experience is to establish a sustainable cooperative partnership with universities both at home and abroad and take a cooperative way of “production-study-research”.

? . Requirements to establish a cooperative relationship between enterprise and university

In order to improve the comprehensive ability of its staff, accumulate its human resource and furthermore enhance its core competitiveness, the enterprise should do it from both inside the enterprise and outside the enterprise --- that is to cultivate technical talents in the process of technical innovation and management innovation from inside; while to seek intellectual resource and technical support from outside society, however mainly from universities. Just because universities possess complete disciplines, rich in teaching resource, have special advantage in teaching condition and forces, and own latest science and technology, which makes them the ideal cooperative partner to enterprise. Thus, it is an objective need to establish a broad cooperation between enterprises and universities.

Baosteel has the same wish. Since the establishment, Baosteel pays great attention to the cooperation with universities at home and abroad and actively seeks supports from them. Till now, Baosteel has established close cooperative relationship with more than ten famous universities in china as well as abroad, such as Tsinghua University, Fudan University, Jiaotong University, and Zhejiang University, California University Berkeley Branch, West

Virginia University, Welse University of UK, and Twente University of Holland.

The goal of university education is to cultivate all kinds of technical talents for the whole society. Enterprises are the main body to use the talents to make their products and service more competitive in the market, meanwhile according to the industry development, to raise new requirements of talents to universities. So, universities should orient enterprises to adjust their specialized structure timely, developing the specialties urgently needed by enterprises. On the other hand, as the main executor of national innovative system, university bears the responsibility of theoretical research and technical development. It is a place to achieve technical achievements. Enterprise is a main body for national economic development and technical innovation. Universities must strengthen the theories applying to practical production and help solve the practical problem, promoting technical achievements converting to practical productive forces, pushing and supporting the technical innovation of enterprises. Meanwhile, universities have achieved their own value and accelerated the development. Hence, universities have the same urgent requirement for cooperation as enterprise.

? . The five highlights to establish cooperative partnership between enterprises and universities

For the past 20 years, in principle of mutual benefits and joint development, Baosteel has established long-term cooperation with many universities both at home and abroad in terms of engineering education and technical innovation, which is very fruitful.

1. Development of human resource: while using educational resource of university to cultivate talents with comprehensive abilities, enterprise has also indicated the direction for educational reform and applicable talents' training in university.

At present, the trend for enterprises' merging and restructuring to group and diversified development has been quickened. Accordingly, new requirements are raised for its staff in fields of engineering technology, operation, management, trading and finance. So according to the plan of human resource development, combined with the practical requirements from enterprise production and management, Baosteel has cooperated with a number of universities at home and abroad. Taking full use of these universities, Baosteel made an effective attempt for its three types of talents with comprehensive abilities covering management, engineering technology, and operational skill. The three types of talents are as follows: Talents in field of management who know not only specialized technology but also international trading; talents in field of engineering technology who can not only solve the engineering technical problems but also master management knowledge; talents in field of operation who not only master operational skill on the post but also can solve the problems on working site. For example, a training class was held for Baosteel trading managers by both Baosteel and Shanghai Foreign Trade Institute. An international financial class for second academic degree was held by both Baosteel and East China Normal University. Also held is a MBA class with Asia-Pacific MBA School of California University. All the graduates from these classes have been the backbones of Baosteel international trading, while some been the leaders in Baosteel subsidiaries. In terms of engineering technology, Baosteel together with Zhejiang University, Northeast University and Shanghai Jiaotong University has set up several seminar classes such as "Integration of hydraulic, electricity and computer controlling" and "integration of electricity,

instrument, and computer controlling”. Because these universities have undertaken some projects in Baosteel, the teachers accumulated a lot of technical experience to solve the problem of working site in the course of project research and technical development. At the same time, these teachers acted as the lecturers of these seminar classes, which achieved a successful effect. One of the technicians from the seminar class once said: Before, when the machine was out of order, both mechanical engineers and electrical engineers should come the working site to fix the breakdown. But now, after my training in the seminar class, I can solve the problem by myself. The time has been reduced.

University, on basis of the information obtained during its providing educational service for enterprise, should adjust its disciplinary contents and specialized structure in time so as to satisfy the needs of society and enterprise. Baosteel’s cooperative universities, such as Northeast University, Shanghai Jiaotong University as well as Twente University, have once adjusted their specialties, installed special courses, improve teaching contents or perfect teaching methods, according to Baosteel special demands for talents in certain period of time.

2. Continuous engineering education: Depending on educational resources of universities to develop continuous engineering education and improve the comprehensive abilities for its staff, enterprise should strengthen its contacts with universities, which is also a good way to promote the capabilities of universities to orient the society, serve for the society and satisfy the needs of society.

If enterprise wants to guarantee the sustainable development of production capability through technical progress, it must strengthen its continuous engineering education. Continuous engineering education provides a shortcut for technicians to renew their concepts and knowledge, broaden their horizon and perfect their knowledge structure. It is also an important way to improve staff’s performance, promote their competitiveness, keep activeness for the professional technical team and eventually enhance core competitiveness of enterprise.

The starting point of Baosteel continuous engineering education is to strive for exploring a best combination among the latest development of world engineering technology, the requirement of Baosteel technical innovation and the need to improve Baosteel technicians’ performance. The basic task is to ensure the engineering technology of Baosteel to be the world level. Baosteel leaders emphasized constantly that Baosteel technicians should closely watch the trend for international development of advanced technology. Baosteel should cultivate the disciplinary guide with high level so as to promote the technical progress of Baosteel. Therefore, with the cooperative relationship with universities, depending on educational resource and strength of universities, Baosteel will invite university teachers to help teaching and give lectures, who provide intensive training of foreign language and computer application for various technicians and hold all kinds of lectures and seminars of advanced technology. Baosteel also send some outstanding technicians to university for special training.

3. Cooperation in science and research: while making use of the research force of university to achieve the enterprise’s innovation and solve technical problems, enterprise also has enhanced the research strength for university and provided a lot of opportunities for university technical development.

Baosteel insists on technical innovation. Technical innovation has been the key link to achieve

the goal --“to be the first class enterprise in the world and to achieve the first level of the world”. In order to be the top class of the world, Baosteel has a lot of difficult research projects to do. So, many scholars and experts from universities come to Baosteel for jointly solving the difficult problems in scientific research projects. Cooperation between both sides improves the thinking capacity and broaden the horizon of Baosteel managers and technicians, meanwhile also provides abundant opportunities for the technical development of university.

4. Technical achievements’ transforming and application: the technical achievements of university have been transformed and applied in the enterprise, which has promoted the joint development of enterprise and university.

The Chinese reform has changed the present system of science and technology. Universities have been the important executors of national innovative system, undertaking a great deal of scientific research and technical development. Its technical achievements must be transformed and applied in the relevant industries. But at present, the transformation of technical achievements in the university doesn’t match with the social requirements. There are two reasons --- one reason comes from the university and the other is from society. By ways of cultivating talents for enterprise, cooperative research and technical innovation, both university and enterprise obtain sufficient understanding and mutual trust. In this way, the technical achievements can be transformed and applied in the enterprise and finally promote the joint development of both sides.

During these years, Baosteel has made a successful exploration in the cooperation of “production-study-research” with universities. Through setting up the national prize of “Baosteel important technical progress achievements” and with the aid of famous universities and scientific research institutes, both parties have jointly solved the key problems and developed new technologies. Baosteel has signed more than 1000 cooperative agreements with universities and institutes, whose value amount to billions. More than 60 cooperative units have been awarded the prize.

5. Cultivating industry talents: cultivating industry talents in the course of spreading enterprise advanced technology, jointly improving both parties’ reputation, and obtaining social values.

Since 1980s, Baosteel has imported advanced equipments and technologies of world level. For the past 20 years, through sustainable innovation of technology, management, system and culture, Baosteel keeps its leading role in the fields of technology and equipment in the world steel manufacturers and has formed a complete set of management methods for modern enterprises with Baosteel characters, which set an example for Chinese outstanding state-owned enterprises successfully managed in capital market. In the early period of construction, Baosteel has obtained great support form universities. As return, Baosteel receives many students from universities for practice every year. Baosteel has become the most ideal practical training base for universities in China. The cooperation between Baosteel and universities is going on with various ways, such as jointly collecting teaching case, compiling teaching materials, mutually inviting experts to be the part-time professors. By means of education for academic degree, short-term training, seminar and technical exchange, the cooperation orients the continuous engineering education in metallurgic industry, which has cultivated a lot of metallurgic talents.

? . Eight patterns to establish cooperative partnership, to effectively develop engineering education and to promote joint development of both parties

1. Scholars, professors and experts from universities giving lectures in enterprise, taking part in engineering projects and solving scientific research problems.

Baosteel invites academicians, famous professors, experts and scholars to give lectures in Baosteel, introducing latest technical information and teaching latest technical knowledge. Baosteel has invited more than 80 professors, scholars, and experts in fields of economy, management, finance and law for lectures, such as Li Yining, famous economist in China, Professor Jiang Xuemo, LinLin, Zhou Hanmin etc.. These lectures promoted concept changing and capability improving for Baosteel managers. A system to invite scholars, professors, and experts from universities to give lectures in Baosteel has been formed. Till now, Baosteel has signed agreements with 48 famous professors from 22 universities in China to invite them to be part-time professors or consultants in Baosteel continuous engineering education

In order to push the technical innovation, Baosteel actively broaden the cooperative channels. Through setting up national prize and with the aid of famous universities as well as science & research institutes, both parties has jointly solved the key problems and develop new technologies. Every year, Baosteel has signed contracts with relevant universities in China for hundred of scientific research projects. The total contracts value for the projects reaches tens of million yuan. Till now, Baosteel has had many research projects with Beijing University of Science and Technology, Northeast University, Zhejiang University, Shanghai Jiaotong University, and Shanghai University.

2. Technical backbones from enterprise having a further study in universities

Every year, Baosteel holds foreign language proficiency test for its staff, especially for new graduates to Baosteel. Through the test, Baosteel sends a number of young technicians with good foreign language capability to Fudan University, Shanghai Jiaotong University, Shanghai International Study University and Zhejiang University to have intensive language training. The students can reach the ability of “reading, writing, listening, and speaking” after training. In Baosteel workshops, you will find that many young technicians can exchange with experts with fluent foreign language.

Every year, nearly 150 staff are sent to various universities to have intensive foreign language training; nearly 20 staff with good foreign language capability being sent to study in Zhejiang University for TOEFL test. In order to satisfy the needs to establish a joint-venture company in Brazil, Baosteel is sending a number of staff to study Portuguese.

Baosteel has selected outstanding young technicians with more than 3 years working experience in working site to study for second bachelor degree, PH.D, or master degree in famous universities. Some have graduated from universities and been back working in the enterprise. Baosteel has cooperated with Fudan University, Shanghai Financial & Economic University for on- the - job MBA training. Baosteel also sent its young and middle-aged leaders to overseas universities and companies, and its mangers and financial staff to Sino-Europe International MBA School and Shanghai National Accounting School for training.

3. Teachers and students from universities having practice in enterprise

In order to make Baosteel become the practice center for universities and other enterprises, Baosteel Educational & Training Center has established a special department in charge of making plans of practice for those graduates from universities. From 1991 to 2004, Baosteel has received 37,000 university undergraduates to practice in the company, 4,000 students to have social practice in summer vacation and 400 young teachers from universities for field trip. Every year, Baosteel receives the students from famous universities abroad to practice in Baosteel, such as UBC of Canada, Massachusetts Institute of U.S.A., and Twente University of Holland etc..

4. Jointly running a school to develop engineering education and cultivate technical talents with various levels.

According to the practical requirements of enterprise development, Baosteel adopts the way to jointly run a school with universities and cultivate technical talents with various levels, thus further strengthen the cooperation with universities. During these years, Baosteel has cooperated with Northeast University and Beijing University of Science and Technology to establish Baosteel Branch affiliated to Northeast University Postgraduate Institute and Baosteel Branch affiliated to Beijing University of Science and Technology Postgraduate Institute respectively. Also cooperated is with Shanghai Jiaotong University to enroll Baosteel graduates for master degree of engineering.

In 1998, Baosteel has cooperated with China (Hainan) Reform & Development Research Institute (CRDRI in short) to establish CRDRI Baosteel Branch. Baosteel has made full use of the broad social network of CRDRI and its abundant educational information to cultivate MBA and management talents for Baosteel. From 2000, Baosteel has cooperated with Anhui University of Technology to establish Senior Vocational Technical College. The College utilizes Baosteel's training and technical resource. It enrolls college students from on-the-job staff in Baosteel. It creates a new training model, in which students can not only obtain diplomas issued by Anhui University of Technology but also get the certificates of senior workers as well as the diplomas issued by Baosteel Senior Mechanics' School.

In 1992, Baosteel and Northeast University jointly established "Baosteel-Northeast University Continuous Engineering Educational Center", which is located in Baosteel. It can directly provide continuous engineering education for Baosteel but also serve for the Metallurgic industry in China. Since the establishment, various technical lectures, seminar classes, and training classes for specialized technology have been held every year. The teachers from universities teach theoretical knowledge, while Baosteel technical experts show practical application of the knowledge in working site. In 2001, Baosteel and Northeast University jointly established Baosteel Branch affiliated to Northeast University Network Institute. The students study from long-distance network. Baosteel Branch installs various specialties needed by enterprise development and cultivates technical talents with college level.

5. Compiling teaching materials of continuing engineering education corporately and carrying out theoretical study of continuing engineering education

For the past few years, Baosteel carried out theoretical and methodological study of enterprise continuing engineering education with the teachers, who are from high level

institutions such as North East University ,Beijing Science and Technology University , Chongqing University , Shanghai Communication University and soon and compiled a variety of practical teaching materials, for example, Baosteel Con-casting Equipment and Technology, Automatic Control of Plate and Sheet Thickness, Process Control of Tandem Cold Rolling Machines, Modern Steel Making Technology, Contemporary Motor Speed Control Technology, which were widely used in the continuing rebuilding classes.

6. Establishing collaborated engineering research institutes and carrying out task study
Establishing collaborated engineering research institutes among enterprise and high learning institution is another model of cooperation in production , learning and research among Baosteel and universities , in which with a question for discussion as its cooperation content , a joint engineering research institutes as its base , the enterprise and universities work together to realize technical innovation and cultivate high level talents.

The new century saw that a collaborated automobile sheet application technology research institute was set up by Baosteel and Shanghai Communication University, in which both sides work together to tackle a series of practical and key problems. Moreover ,Baosteel invested to build a state key library of rolling technology and con-casting automation (in North East University) ,in which new theories ,new techniques and new technology of rolling process were studied and critical technical problems of rolling production were figured out. With questions for discussion at hand and under the guidance of the technologists technical employees from Baosteel studied in the state key library, in which they tackled task researches by using advanced research equipment and scientific and technical information network .Therefore the problems of products R&D and technical innovation were solved ,meanwhile , the high level technical employees of both sides hammer harden their scientific innovation competence.

7. Setting up postdoctoral research station and cultivating research staff with high learning institutions

In October , 1994, Baosteel set up the first postdoctoral scientific research station in China, in which eleven majors included, such as metallurgy, automation control , computer, mechanics , financing , marketing ,MBA and so on.. More or less six postdoctoral research employees are enrolled into the postdoctoral research station every year. This system belongs to one of the new models of cooperation of production, learning and research, in which the research projects were put forward by the enterprise in accordance with its demand, the outlay were funded by the enterprise and the researches were mainly carried out in the enterprise.

The postdoctoral research station made the best use of advantages ,for example , fine conditions of the high learning institutions and research institution , powerful technical strength , symmetrical information , well-knitting of the enterprise research projects and practice ,rich fund , fine hammer-hardening conditions and so on ,which promoted the cooperation of production , learning and research and brought up high level technical and managing talents, who were suitable to sustainable development of our national economy. The postdoctoral station model not only made a breakthrough in research and development ,investment system and high level talents cultivation , strengthened the contact of

enterprise and high learning institutions , deepened the development of cooperation of production , learning and research, but also brought economical benefits to the enterprise and promote the technical renewal and development of the high -tech.

8. Establishing overseas training base and intensifying international talents cultivation by cooperating with international prestigious universities

With the enterprise open to the outside world, participating in the international market competition and expanding itself overseas , enterprise continuing education demands became more wide-ranged , rich-contented and stringent. Since 1991,Baosteel have signed cooperation agreement on high level visit, talents cultivation, collaborated research, and academic exchange with a batch of overseas prestigious high learning institutions such as University of Cardiff-Wales of UK, Twente University of Nethreland,Lyre University of Belgium ,Luedenscheid Technical School of Germany , Helsinki Technology University of Finland ,Barkley University of California ,USA, West California University of USA, State University of NewYork ,USA, Britain Colombia University of Canada and carried out various and effective cooperation in the fields of mechanical engineering , electrical engineering , computerizing engineering , material engineering , MBA, human resources development and education technology, among which Helsinki Technology University of Holland, Berrkeley University of California ,USA and Vocational College of Germany became overseas training bases of Baosteel.

Currently, three Baosteel internationalized high level talents teams came into being , that is, a high level business managing talent team who know about running laws of local and international market economy and master the international rules ; a scientific research talent team who possess research experience of international cooperation and cut-edging technical skills; a senior technician team who master international advance technology with one specialty and multi-competence .Nowadays , Baosteel will keep and develop its cooperation with international prestigious universities ,strengthen construction of its overseas training bases , continue its implement of projects such as overseas training , base hammer hardening , collaborated research, academic exchange and so on and explore and establish an internationalized model of talents cultivation.

IV. Five points about collaborated partnership among the enterprise and high learning institutions

1. Corperating among enterprises and high learning institutions is an inevitable tendency to carry out engineering education and cultivate high level talents

In case of economic globalization and market competition, the qualification of the multi-competence talents which were required by the enterprise became higher and higher. It is the true that the demands of the enterprise will be met by relying on not only the enterprise itself but also the social resource network, in which enterprise training were carried out in high learning institution and scientific research institute .In turn, it is inevitable that the demands of the enterprise for talents will be reflected by the university education methods and talents cultivation models and have an influence on the talents cultivation in the universities. With cultivating multi level talents for the society as its aim, it is required that the high learning face

the society and enterprise as well. Therefore, universities and enterprises should strengthen their cooperation, establish partnership, supplement each other and work together to study the talents cultivation model and accomplish talent cultivation task.

2. Recognition of the high level leaders of enterprises and high learning institutions is a premise of sustainable partnership

The successful cooperation among enterprises and universities and sustainable partnership relies on recognition and strategy of the high level leaders of both enterprises and high learning institutions. Given the premise, the cooperation among Baosteel and enterprises was productive. For example, in terms of the cooperation between Baosteel and Northeast University, an annual meeting is held by the leaders of both parties. At the meeting, both parties will review and discuss the process of the cooperation.

3. Choosing appropriate point to go into is the basis of the sustained cooperative partnership

Both parties should focus joint efforts on a shared base point so as to enjoy fruitful achievement. For the university-and-enterprise cooperation, this point refers to those problems occurring in production, operation, scientific research and development as well as talents training. By taking how to settle those problems as cooperative task, both parties will certainly enjoy common benefits and ever strengthened partnership through joint efforts.

4. Material investment is critical to the sustainable cooperative partnership

Certain material and capital investment from both parties are critical to keeping sustainable cooperation between university and enterprise. Therefore, smooth operation of the cooperative project will be ensured. To enterprise, investing certain material and outlay will provide the university with economic support; to university, apart from manpower investment, certain material devotion is also in need, especially in the prophase of the cooperative project. In this respect, Baosteel put forward over 40 million yuan for education and training. Besides, Baosteel has spent much on establishing a dormitory building, particularly providing free-of-charge accommodations for teachers and students from universities. Moreover, those high-level researchers with Ph.D degree enjoy the sound working and living condition provided by Baosteel, including lodging, tip-top computers and some necessities.

5. Sound cultural environment guarantees the sustainable cooperative partnership

Successful cooperation is in dire need of mutual trust, mutual respect, courtesy and honesty. Both parties should stride side by side toward the common targets. The cooperation between Baosteel and university from both at home and abroad will show you what the cooperation is like. There exist a common view shared by Baosteel and those universities that their cooperation is a kind of practice of developing motherland by science and education and that their cooperation is positive to the development of both enterprise and universities. It is due to this excellent thought that both parties are able to make their efforts to create a sound cultural atmosphere, which is also an important reason of the successful cooperation.

V. Conclusion

The new round strategic target of Baosteel development has been determined, that is to say,

Baosteel is to become a first-class transnational corporation listed in the top 500, enjoying self-owned intellectual property and great comprehensive competitive strength as well as social respect. In order to fulfill it, Baosteel will vigorously push the strategy of developing enterprise by training talents on the road of sustained innovation. For this end, Baosteel, as usual, will strengthen the cooperation with those famous universities both at home and abroad to figure out the mode of enterprise-and-university cooperation with the aim of fostering high-qualified talents, of push forward mutual development and of make more contribution to the society.

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