Human Resources Marketing and Recruiting: Vocational Training in China

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Contents

Abstract

Vocational training in China gets more and more attention in society. It is a long way to establish a well-working dual education system to prepare the youth for sustainable employment in a modern economic environment. Due to the fact that Chinese economy is growing constantly and foreign companies established their business in China, the requirements of skills changed in the past few years. China is not the playground for quick wins and low-cost production anymore, but business and products reach a serious level, which is close to Western standard.

The following case study shows how it can work, which hurdles have to be cleared, what kind of circumstances have to be obtained, and where the mind-set has to be changed. Starting from the political decision to change a vocational

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training system to a more suitable one, meeting industry demands faces a lot of challenges, changes, and chances.

The top-down approach has to bridge a big gap and only people involved can make the difference. In the past a lot of investigations were taken by different organizations regarding which country has the best education program in general. But there is no clear answer about that. No system is directly transferable as a blueprint to another country.

It takes a lot of persuading, but at the end, the most important aspect is to have a rough idea, define responsibilities, and start with a small project. Regular communication and evaluation and monitoring the process are essential and lead to success.

Keywords

Introduction/actual situation • Preparation • Teacher education • Students • Learning • Daily routine/execution • Perspective

Introduction

Vocational training has a long-lasting history in Germany and guarantees a stable and well-educated workforce. Most of the bigger companies established their own technical training center and deliver the practical oriented training. Therefore, each company installed a training organization to ensure the quality of the apprentices. Next to an own training facility, the most important aspect is well-educated and qualified trainers. Basically, these trainers joined the vocational training system some years ago, got later on some basic methodical and didactical training, and gained the first experience with a small group of apprentices. It needs at least 2 years to conduct a holistic education approach.

The second pillar in vocational training belongs to a government-owned vocational school. Teachers take care about the theory. Most of the teachers have a diploma or bachelor's degree and are focused on conducting theoretical contents according to their major.

The general vocational training duration takes three and a half years; in special cases it can be shortened. All in all, apprentices spend two thirds of the apprenticeship in the technical training center, one third in school. For the entire duration, all apprentices sign a contract with the company and get a monthly salary.

The situation in China is different. The biggest difference is all the apprentices belong to the school, thus to the government, and have to pay tuition.

All teachers have at least a diploma or bachelor degree and are responsible for theory training in their respective field.

Since several years the Chinese government takes high attention to develop the vocational training situation and cooperate with some Western countries. Besides that, the government spends a lot of money in training teachers abroad, buying new training equipment and building up new facilities. The necessary conditions are created and ready to use.

Due to the fast economic growth of China and the higher demands from the industry, the workforce and therein the people have to be trained and qualified in a more effective way. New technologies, cost-saving measures, and high quality standards need employees who are aware about that and can deliver their knowledge to satisfy customers' demands.

A lot of globally acting companies try to solve this problem with an effective qualification program. To make it successful and sustainable, it is important to spend a lot of efforts in vocational training. A close cooperation between companies and schools is the first step for a bright future, not only for the business, mainly for the employees and their families.

The government is aware about the situation that most graduates want to study in higher education to get at least a bachelor's degree. A lot of efforts were made in the last 10 years; the biggest problem is and will be that vocational training has not got a high reputation in society.

Preparation

All German car producers want to expand the business in China. Different joint ventures were set up with the focus on local total production after a while. Milestones were defined and one was the establishment of an own vocational training system. The responsible managers possess a lot of experience running vocational training in Germany, but what about China? Is it possible to implement the same system, which will be the suitable cooperate school, and how to convince the partners about the cost intensive approach?

A lot of questions raised and the answers were difficult to find. Luckily, the project had priority and high management attention. A small team with a Chinese and a German was founded and both ran the project. The Chinese colleague tried to get in contact with some governmental officials; the German colleague tried to get support from Germany. The best idea and most important decision was put into practice. A German master trainer from the German car company should come to China to help and support the establishment of an own-operated vocational training school.

After successful negotiation with a department of the Beijing Municipal Education Commission , one school was pointed out to be the partner for a common Chinese-German cooperation.

Learning Journey to Germany

Officials, school representatives, and teachers went for a learning journey to Germany. During their 2 weeks stay, they visited different company-owned training centers. The objectives were clearly defined and both parties did their best to start a bright, shining project.

The Chinese visitors were basically interested in hardware that means equipment, tools, and the facility themselves. After a while, the discussion turned to the soft factors. Nothing is running by hardware alone; the people behind make the differences. The most important role in the education process belongs to the master trainer. How good are they educated? What does the company provide for further development? What is the trainer/apprentices ratio?

A lot of explanations were necessary to convince the Chinese delegation. It was often mentioned that technical training has a long tradition and is developed over years. Also, the close cooperation with all relevant business units is important to evaluate the needs and trends. To be open minded and able for lifelong learning is mandatory to deal with apprentices as well as understanding the youth. Next to all knowledge and practical skills, a high focus is on soft skills. Trainers should be able to deliver fruitful feedback for individual growth. It is the holistic approach that makes it happen.

One question appeared very often: what kind of training material (hardware) can the car company provide? The answer was not satisfying the guests. Nearly all electrical training boards or mechatronic kits were designed and produced by apprentices and are not available at the market. During this manufacturing process, an effective learning and understanding are guaranteed, and the technical knowledge is developing constantly.

At the end of these packed and intensive days, everybody was motivated to support the project. Although the Chinese colleagues understood that through this close cooperation there will be a lot of changes in the future, and therefore, they were a little bit doubtful at that early stage.

Master Trainer from Germany to China

Just a couple of weeks later, a German master trainer visited Beijing. The focus was to:

1. Check the facility and give some recommendation.
2. Show the idea of implementation of technical skills.
3. Select teachers by interview and give suggestions.
4. Learn how China is working and think about whether to spend all his efforts and energy in China for a while.

The first condition was easy to handle. Due to the fact that the school moved to a new campus, everything was brand new. Suggestions regarding equipment were noticed with the promise to order. The money for hardware was not a problem at that time because the budget was sufficient.

The first group was a batch of future assembly fitters. In their future job, they need mechanical skills and knowledge including usage of different kinds of machines, joining technologies, as well as basics on painting. To teach all of these in real life, each participant had to produce his/her own product (a model car) and needs an

own-assigned workbench to do so. It was not easy to convince the local partners of this approach and of the workbench for each participant.

Selecting Teachers

From a group of ten, four teachers had to be selected. Some requirements were set up at the beginning, like how many years of experience and what kind of major communication ability and open-mindedness to learn new education style. A translator was needed because of the lack of candidates' English skills.

There is a significant difference between German and Chinese proficiency in the English language. If in Germany a pupil/student gets an intermediate mark, his/her English skills are sufficient to engage in a basic conversation. In China many graduates who passed the CET 4 (College English Test) lack the ability to communicate in English.

The ten candidates provided were well prepared and everybody had an English written CV. Some of them failed because their majors did not fit to the requirements or they were not teachers anymore and worked already at the management level in school.

At the end, suggestions with pros and cons were given to the school principle, and after internal discussion, four teachers were selected to join the program. Of the candidates chosen, each had an interesting history as teacher. For example, one female teacher was educated for 3 months in New Zealand and two male teachers had a short-term assignment in Germany several years ago.

Teacher Education

In June 2006 the two female and two male teachers were sent to Germany to attend a 4 weeks training at the "State Academy for In-Service Training and Human Resources Development at Schools" in Esslingen. The program was developed in close cooperation between the car company, and the academy's. main focus was "activity-oriented learning."

The Chinese teaching and learning method is usually an ex cathedra teaching. The teacher is standing in front of the group, reading phrases from a book, or presenting PowerPoint slides. Students are listening more or less carefully and repeating randomly as a group what the teacher is asking for.

Chinese students are excellent in learning by heart and they can memorize very well. This is a kind of short-term learning. After a certain time, it is hard to remember for the pupils or students what they have learnt a certain while before.

Many Chinese schools are very modern equipped, with projectors and computers in each theory classroom and teachers using preferably PowerPoint. The position and standing in the society of a teacher is very high. Therefore, it is very important that the teacher knows everything. The teachers themselves ensure the smooth teaching approach by trying to avoid possibilities for their students to ask questions.

This has something to do with the Chinese culture. Losing face has to be avoided. Unexpected questions can bring a teacher in an uncomfortable situation.

The first day in Esslingen was packed with a lot of information, the introduction of all participants, the agenda, and the weekend activities. From the next day on, hard-learning staff met the teachers and interpreter. Half a day was used to explain the "dual system." The cooperation between enterprises and state-owned vocational training schools should work as a role model for the new establishment of both parties in Beijing. At the beginning some employees of the enterprise joined the lessons as well. Everybody wanted to know more about each other. In China it is of high importance to create a bond of trust.

In the first couple of days, teachers were acting like traditional Chinese students. Listen carefully, write everything down, and be silent. Slowly, the teachers dared to ask questions when some aspects were not totally understood.

One obvious problem occurred. The interpreter was able to translate the regular communication. When it came to specific technological terms, the interpreter's knowledge was limited. The stunning faces of the teachers emphasized that observation.

Nevertheless, everybody tried to give all the best for a common success. The atmosphere and the mood of all participants were always good. There was only one reason for criticism, the food. Chinese abroad cannot survive without their loved dishes. One room got a portable stove and in the evening, big cooking events made everybody happy.

To learn more about the interaction between theory and practice, the facilitator used real examples, like the brake system of the car. Generally speaking, the syllabus of a job profile is distributed in several key functions. When talking about the car mechatronic as a job profile, there are 14 different key functions, e.g., engine and combustion, transmission and driveshaft, axles, electrical systems, chassis, etc.

The professional teaching approach consists of six different sequences:

Informing – **Planning** – **Deciding** – **Executing** – **Inspecting** – **Evaluating**

If learning is implemented as a complete action in the training, it results in a higher productive efficiency of the skilled workers. That means, it is important that students learn in an early stage to follow these six steps independently as soon as possible. Sure, at the beginning the teacher has to explain more details and more deeply. After a certain while, the teacher is changing his/her role and is acting like a coach and supports only when it is necessary or the learning progress is to be at risk.

The six sequences in detail:

Informing: Students use media, documents, the Internet, or technical books to learn as much as possible theory to accomplish the given task. In the mentioned case, the topic area was "Different brake systems and their functions."

Planning: Students have to check the brakes on an existing car. Therefore, they have to write down a working plan that mentions what kind of equipment has to be

used, which tools and measurement tools, and the different working steps have to be listed.

Deciding: Usually, this step has to be done by students and teacher together. Students show their documents and explain the working approach to the teacher. It should be a dialog between both parties and the teacher should use questions that she/he can distinguish if the students understood the content well. Later on, the decision can also be done with a group of students, depending on their experience.

Executing: Now, students are going to the car and execute the given task. Here, the teacher has to control the working safety and observe the action and handling carefully. It is helpful to make some notes for later discussion.

Inspecting: Students write down the results and recheck it, clean the working place and store the tools and equipment, and the task is finished.

Evaluating: Finally, evaluation is done to see whether all steps have taken an optimal course. This has to happen together with the teacher through a technical discussion.

Errors and aberrations from the planning are analyzed. The workflow is examined simultaneously and mistakes that could be avoided in the future are detected. Thus, the students can assess their strengths and weaknesses and develop objective quality benchmarks for their actions.

This evaluation also pursues pedagogic aims. The existing qualification deficits shall be recognized in order to target their removal. Moreover, a final work review – in which the individual action steps are recapitulated on the basis of the action result – supports the internalization of the action.

As the activity knowledge is still to be built up, the activity execution demands a comprehensive and reflected planning of the workflow. The students often already know some basics or partial aspects of completion of a task through the company or vocational school. But a lot is still to be accomplished before the execution of the planned work assignment can be started. In such a situation, students often want to try out immediately whether and how they can proceed with the solution of an assignment. But such an approach should be avoided even though "making mistakes" is allowed.

An "although-they-do-not-know-why-but-they-do-it" mentality cannot do justice to activity-oriented learning. Radical learning processes can thus not be implemented.

Here, the teacher shall intervene and demand a goal-oriented planning of the action steps, because the learning starts from this point. Hence, the teacher has to observe the learning process and intervene, if necessary. From a didactic point of view, it is very important that the action steps are formulated by the students. Therefore, their ideas about the work assignments have to be put down in writing and subsequently have to be discussed with the teacher. The recognition of problems which – for the time being – prevent reaching the goal requires the understanding of the basics and background of a work assignment by the students.

That is the theory behind activity-oriented learning. In reality and especially for all the Chinese teachers, it was hard to catch the idea. The teachers always compared immediately their teaching environment in China with the learning atmosphere in Esslingen. One aspect was always mentioned: our classes are too huge to follow activity-oriented learning. Instead of trying to find solutions on how to apply the new method, they were busy trying to justify the traditional method.

During teaching hours, another problem occurred. The teachers never heard something about the coherence between different competences. In their mind teaching and training is only related to technical skills and competences.

For the accomplishment of work assignments in the industry, however, extensive qualifications are necessary that go above and beyond the pure technical area. Only those skilled workers who have the **action competence** at their command are able to adjust to new requirements as opposed to just being qualified to repeat processes they once learned.

Qualification denotes the direct utilization and application of what has been learnt.

Competence, however, describes the ability of the individual to act appropriately and responsibly in a given action situation as well as to be willing and able to acquire new qualifications.

Thus, besides the professional competences, methodical, social, and personal competences, which are independent from the direct workflow, are increasingly expected from the skilled worker.

Action competence is the ability to accomplish new work assignments in time and repeating. The skilled worker must be able to deliver required work results in appropriate time; to decide about means, materials, procedures, etc., to be applied; to obtain the necessary information; and to communicate with the client, peers, and colleagues. He/she has to be able to structure the work in a sensible manner and execute and review it. Thus, occupational learning means the acquisition of action competence. Competence is much more far reaching than qualification. A skilled worker can be professionally qualified, but that does not necessarily make him/her "capable of acting" precisely because he/she possibly lacks the ability to work in teams and the motivation, the self-organization or the independent and responsible planning ability.

Professional competence consists not only of knowledge, skills, and abilities directly related to the profession. Besides the theoretic knowledge and the practical, well-founded handling of materials, substances, appliances, tools, and machines, the ability to transfer knowledge and to be able to apply it to new tasks also belongs to it. Professional tasks have to be recognized; procedures for problem solutions and decision-making regarding possible work techniques have to be mastered and evaluated. At the same time, professional and methodical handling of tasks have to be ensured to be able to apply what has been learned in the professional life.

Methodical competence shall enable the future skilled worker to apply his learned and tested abilities and experiences flexibly and creatively to unknown situations and fields of activity. Such a method competence can especially be promoted through an activity-based and project-oriented instruction during the

training. For the trainees, the point is to recognize task structures, apply and evaluate problem-solving and decision-making procedures, and transfer their gained knowledge independently on specific tasks which solution is not clear and predetermined from the outset.

Social competence defines the ability to cooperate, resolve conflicts, communicate, and interact in professionally demanding situations. Social relationships and interests have to be grasped and understood to be able to deal and communicate with others sensibly and responsibly. Among others, it is about the teamwork, tolerance, cooperation, politeness, conflict resolution, and responsibility and solving individual and common tasks. An adequate competence and a responsible action can mainly be internalized by your own activities and by the joint work in groups.

Personal competence is the ability to act for oneself and toward others responsibly and reliably. That means gain in reliability, willingness to learn and perform persevering, and ability to work under pressure. It also includes the development of accuracy and conscientiousness, of independence and readiness, to take on responsibility. But also, the ability for criticism and self-evaluation as well as the enhancement of creativity and flexibility should be fostered. The more the students are motivated to cope independently with a task – important both to them and others – the more such a competence can be built up.

After that theoretical introduction, the holistic teaching approach was set up. Methods were defined; the didactical concept and syllabus was introduced, and learning targets were clear and some technical details understood. As this was a completely new way of teaching, some of the teachers appeared to be slightly overloaded by all the new inputs.

Four weeks of intensive teaching was over; the group moved to a vocational training center of the car company. It was planned that teachers got an insight how apprentices get trained in a company-driven training center. Now, they experienced very close the daily cooperation between apprentices and German master trainers. Sure, it wasn't easy for the translator to translate each single word, but through observation the teachers learnt a lot. They were astonished how motivated and curious the students were, asked questions, and discussed with the trainer in a polite manner. This was very seldom in China at that time. Also, they recognized a calm atmosphere while every student had some tasks to fulfill and followed the action-oriented teaching.

How to bring these standards to China? A big question mark occurred in each teachers face.

Students

Participants in vocational training are called students in China. This sounds better than apprentices and expresses no differences to students in universities. All students, no matter which institute, school, college, or university, are united under the umbrella of the Ministry of Education. It is scaled from national level until provincial level. In Beijing alone, there are 250 vocational training schools offering different

kinds of professions or job profiles. Each school that exists has roughly about 3,500 students in total and 250 full-time teachers. All teachers must have at least a bachelor's degree. Most of students joining a vocational school did not pass the exam for university. Therefore, their motivation to learn is less because all of them know, after examination, the possibility to catch up a good and well-paid job is very low. But the circumstances are changing in a growing market. Blue collars are the workforce to produce products in high quality. Most of the Western companies pay high attention to the education of their staff, no matter which kind of job they fulfill.

As mentioned in the introduction, the Chinese government knows about the demands of the companies and wants to convince the local producers as well to invest in good-educated and well-trained skilled workers.

To show the holistic approach in recruiting students, the home company's recruiting test papers were used as a blueprint. The test papers were translated. The context was focused on math, logical thinking, Chinese phrases, basic English, and technical understanding. Additionally, a manual hand skills test was established. A short introduction to all parties involved followed so that each member of the recruiting team had the same understanding about the process.

The school made a preselection according to candidates' grades from secondary schools. Two hundred fifty participants in the first round were very nervous about the upcoming test. At that time, it was something new that a foreign company gives suggestions, how students can be recruited. Luckily, the school management was convinced. When there is a new education process; the whole system has to be changed. This was different from experiences from the past when Chinese partners listed carefully to the concepts of foreign partners, took out only some parts which they viewed as "the best," and left the overall process unchanged.

During the test, significant differences between candidates' performance were obvious. Some were really below expectations, a lot of them were good and showed potential, and some of them were outstanding. This situation is typical in recruitment processes for vocational training in Germany also. At the end of the day, it is important that a company recruits students who fit to the culture, the products, and the philosophy of the chosen company. The English test was not highly weighted because most of the candidates' English was really poor and even the supervisors' English was not good enough to judge in a fair manner. One hundred candidates were chosen for the next day, the practical skills test.

This practical skills test consisted of two parts:

1. A quick check about their hands-on skills. A simple drawing was given to each of them and they had to bend a piece of wire according to a drawing. Even here, the differences about the quality were tremendously obvious.
2. All candidates got a second chance and had to build up a car model based on a technical drawing. Forty-five minutes were given to fulfill the task. Only a few candidates could finish in time. Most were visibly overloaded and did not know what to do. One reason can be that Chinese children seldom have the chance to repair a bicycle, for example. If something is broken, it will be given to a repairman on the street, whose business it is. Another example is that in Germany,

kids get toys to build up some models to gain some hands-on skills. This is not so common in China.

Still, companies need staff with hands-on skills and a sense of technical understanding. This is why this type of test is important.

At the end, 24 candidates were chosen to join the "pilot class" for assembly fitter and 24 as car mechatronics.

From this moment on, candidates knew that they are working for a big automotive company, and they were quite proud about this. They moved into their dormitories and got the overview of the schedule and an introduction of the courses. The company provided working clothes and explained the company history and philosophy to create loyalty of the students from an early stage.

The first 4 weeks were covered by Chinese history and military training. These lessons are mandatory according to the Chinese law. After that time, it is negotiable, what kind of lessons are following. Of course, there is a rough plan made by school, but the companies should focus on their demands and establish a training and teaching plan according to their needs. Therefore, it is very important to invest in a person who is permanently in school for an ongoing support. This might be a guarantee for a sustainable development; in the case described, it was definitely true.

Many Chinese, no matter which function they have in daily business, went to foreign countries, asked a lot of questions, and heard about new teaching and training philosophies. The essence of dual education, however, cannot be found in lesson scripts, curricula, or classroom designs – the essence can only be understood when talking with students, on-site masters, and teachers about their experience.

Project Learning

In the following chapter, the focus will be on the assembly fitter education. Therefore, the car company sent a German master trainer to China to stay at least 2 years in the cooperation school to deliver daily on-site support. The trainer from Germany brought technical documents to establish a project-based learning system in the school. The project consists of a 1:10 model of the so-called Unimog. The ideal case of teaching was described above as complete action in training.

For the informing phase, it was very important to find some Chinese textbooks about the information needed. The market for such books is huge. Beginning with technical drawing, a lot of good books were already published in the market. Technical drawing is the entrance card to understand a complete design drawing. In the past students learned some rules and regulations but did not use this knowledge afterwards. Here, it became the foundation for all the next steps. Students got a single drawing from one part of the entire project. They had to:

- Understand the drawing.
- Identify which technical skills were needed to produce this part.

– Deliver the expected quality.
– Know the theory behind it.

Even though the approach sounds straightforward in theory, reality was different. Additional on-site support to the school was necessary to teach all detail skills for the abovementioned learning process.

The "four steps method" is very popular to explain a technical issue and ensure that the students grasp the context.

1. **Preparing and explaining**: The teacher or trainer prepares all relevant materials which are needed to demonstrate what he/she wants to show. He/she gathers students around him/her and explains in detail the technical aspects, the functions, and the security aspects or, when needed, a machine.
2. **Representing and explaining**: The teacher operates with relevant material or machines and explains in detail what he/she is doing and why. Repetitions and asking questions, to ensure students grasp the details, are necessary.
3. **Reproducing and making explanations**: Now, it is the students' turn. They have to handle the given task and explain their action to the teacher. If students can handle the skills acceptable, the next step will follow.
4. **Deepen through exercising**: Students are able to handle tools, machines, and measurement tools by themselves and can fulfill the given task in a proper quality.

Especially, here was the bottleneck in that approach. Only a few Chinese teachers were able to show their hands-on skills. Most of them are theoretically educated in universities and are not used to practice. This was the second important point to preserve German master trainer support. Nevertheless, the most important aspect during the first couple of days was a deep cooperation and communication. Nobody could achieve the highly appreciated goals without the other. Of course, the communication was not that easy at the beginning. The obstacles occurred of something unknown. Communication has to be set up and a foundation of trust and reliability has to be created that cannot be implemented by defining authorities.

Some joint events were organized by the school. Gatherings and activities in leisure times involving the families created the bond of trust which was necessary for success.

Remark: Everywhere in China where foreigners try to speak Mandarin, they are much more welcomed. The same applies to dining habits and selection of food: The more a foreigner expresses his/her appreciation for local culture, the higher the acceptance.

Basically, the project is divided into two parts:

1. **Single exercises**: On a single spare part of the entire product, students learn the relevant technique. That means, here, the students have to inform themselves about the theory, they plan their work, and they discuss with the teacher. Afterwards, the teacher uses the "four steps method" to show the right handling; students execute, inspect the manufactured part, and evaluate it with the help of a quality sheet.

To make it more visible, an example is given. The drawing shows a "steering bearing." Students know how to read the drawing. Then, they write the working plan with different steps: Marking, corning, and filing. They use a high caliper to mark the sizes. The usage of the hammer and center punch to corn. They describe the different files they want to use to fulfill the requirements. The square angle is necessary to check frequently the angularity and flatness; with the vernier caliper, they control the size of the part. After a self-evaluation, students show their result to the teacher. The teacher uses the same quality or evaluation sheet and gives his/her points. One hundred is the highest score; less than 60 means failed. At that stage it makes sense that the teacher has a technical talk to the student. At the beginning it should be individually; later, it can be as a group discussion.

2. **Exercises to deepen the strength**: There are a couple of spare parts which require no new technology or skills. For these parts there is no specific evaluation sheet available. But at the end, when it comes to assembly, failures are easy to detect. Therefore, students have to work very precisely as well. Especially when it comes to machining work, students have to work very carefully and follow the safety instructions. Working carefully all the time, checking the sizes frequently, following the working standards, and trying to achieve a good result are much more important than rushing through. For both, teachers and students, one aspect was hard to accept: cleaning machines and working environment after usage or at the end of the day. Even students were able after a while of permanently exercising, after weekends or vacations it seemed, they forgot everything about cleanness and order and the disaster started again. Companies have to take really good care and have to train their staff regularly to avoid losing control and getting in a mess.

To complete the entire Unimog model, 17 different mechanical skills are necessary:

(a) Quality management: it is divided in several tasks and has to be trained frequently.
(b) Marking: transfer the drawing onto raw material.
(c) Corning and stamping: make the lines visible.
(d) Sawing: the first simple chips workmanship.
(e) Filing: removing chips in different tolerances.
(f) Drilling and lowering: making boreholes by using a machine.
(g) Milling: conventional machining tools driven.
(h) Turning: conventional machining parts rotating.
(i) Tapping: cutting threads.
(j) Grating: increase the quality of boreholes.
(k) Joining: differences between temporary and permanent joints.
(l) Assembling: mount all single parts together.
(m) Material science: has to be taught when new material shows up.
(n) Bending: construction work for cabin and dumper.
(o) Welding: different welding technologies.

(p) Bearing: area of application.
(q) Basic automotive training: how a vehicle works.

This training approach works well in the cooperation school and is still in use. During more than 6 years of close cooperation, the teachers' role changed successfully. All of the teachers on duty are able now to teach, train, and coach students to achieve a technical level, which is appreciated by the company. It was, however, a long process.

The role of the teacher is newly defined with a lot of expectations from company's side.

The teacher takes over a position not so much in the center of the action but in a didactical vital function. He/she has to arrange the learning situation and be responsible for the learning processes. In this case they often take on the function of a mediator or counselor.

Part of the responsibility will be transferred to the trainees. The teacher does not "produce" the knowledge in the heads of the students. Their job is to enable and support the processes of independent development and acquisition of action competences. Teachers design and help rather through learning questions, tasks, and requests and advise the trainees during the planning and execution of action goals. Teachers point out possibilities of action and ask for alternatives, make information sources accessible, and prepare them systematically as needed. Besides this, the teachers support the execution of the work, point out inspection criteria, and counsel during the assessment of work results in the framework of a technical discussion. At the same time, the principle to keep support to a minimum is always applied or in other words: "as little help as possible and only as much support as necessary." Thus, the teacher intervenes in the learning, planning, and work process only if it is not possible for the students to develop solutions independently in reasonable time and required quality.

Students get a new role as well. In primary and secondary schools, they were used to listen to the teacher during ex cathedra teaching. Now, they are requested to participate actively and are in the focus of the new education model.

Here, it may be noted again that action competence is only built up when the acting knowledge is structured and thought through systematically, conceptually, and professionally as well.

Daily Routine/Execution

In the news it is always mentioned how concentrated and disciplined Chinese students are. Sure, as long as they get recorded and the visitors are announced, it looks like the Chinese students are lamblike. Working everyday in a Chinese vocational training school shows another picture. And this picture looks like everywhere in the world, luckily. Students try to explore their constraints. Some try to be the best, some like to cheat, and some are even lazy, but at the end it is the job of a good teacher to educate and guide them. It is very important to set up clear targets

and expectations; ultimately, a good job perspective is given. Everybody's performance counts and everybody is responsible for himself/herself.

The Chinese teachers gave each student some special tasks, e.g., monitor, responsibility for the keys, etc. This was the first step to strengthen their sense of responsibility. If something went wrong, the teacher reacted immediately, gave some small punishment, and noted it. This was one requirement from the company, to observe students' behaviors. Eventually, it affects the scholarship which was provided by the company.

On the other hand, it makes more fun and brings a better atmosphere when a pleasant learning environment is given. Sometimes, a smile on everybody's face makes things easier. And students at the age of 16 or 17 also expect a fair handling. Possibly, the presence of the German trainer was the reason for the smooth progress. Students were curious about the foreign trainer. Why does this guy join their class permanently? He gave instructions to the Chinese teachers, are they not good enough? How to communicate and act with him? A lot of open questions occur, but after a couple of weeks, the German was totally accepted. Everybody got a benefit from each other. The good cooperation and communication between the trainer, the teachers, and the students was never a question of language; it was the question about mutual respect and trust.

The students found out very soon that the trainer wanted to establish a well-running education system at the school and tried to support them whenever it was needed as well and that impressed all students deeply, the trainer showed good hand skills and got dirty hands.

The teachers were a little bit shy at the beginning and did not dare to asked questions or wanted to tell their opinion. But teachers also figured out that the trainer offered help in a kind manner.

Every morning, all teachers, including the trainer, used a small shuttle bus to reach the school. Transportation time was used to discuss the upcoming day. Open issues were clarified, the schedule finalized, and also some private words were spoken.

The students were already in the class after arrival. They behave very disciplined and prepared already tools and equipment. The teacher explained the goals of the day and students started working independently. When it came to presentations that one group had to present the safety rules for using a drilling machine, for example, the students were a little bit nervous at the beginning. The entire groups gathered around the board, no matter how many of them were presenting. After they were used to give a presentation, it was not a problem anymore. Only one student was standing self-confident in front of his/her classmates and presented well. Teachers seldom had to add some contents but when necessary, they did it in a polite manner.

One issue was always under discussion: What are the differences between Chinese and German students in terms of learning?

The answer is crystal clear. There are no differences, when the Chinese students receive the same kind of education like the Germans. Sure, it took a while to arrange everything according to the German standard, but this was reasonable. The key factor for success is the teacher. If the teacher is willing to change and able to

conduct lessons, training, and education as learnt in Germany, then there are no differences detectable. There is only one important point to consider: The German "dual system" is not 1:1 transferable to China or somewhere else in the world. The circumstances in each country are different and have to be respected. There are rules and regulations from ministries which cannot be changed. But the system can be adapted to the existing environment.

Some companies in Germany spend their apprentices 1 week, where they can learn something about soft skills and gain experience in unknown situation to strengthen their social competences.

To give the Chinese students the chance to gain social competences besides daily working and learning as well, soft skills training was separated and taught to experience it randomly.

The focus was set up to six key qualifications:

1. Work methodology: is based on how students learn independently and focused on the professional teaching approach
2. Ability to take the initiative: shows the motivation of students to strive for good results and using their knowledge
3. Communication ability: is based on using the right words in terms of technical items and their ability to give and take feed back
4. Cooperation ability: is based on knowledge sharing and respecting peers
5. Problem solving ability: shows students solution orientation based on experience and their creativity
6. Sense of responsibility: shows the reliability and how students comply with rules and regulations

After half a year, students have to evaluate their performance first based on a performance evaluation sheet. In parallel the teacher is filling out a second form. Afterwards, the student goes into dialog with the teacher and both sheets have to be compared. The reason behind is to know from each other. The teacher explains his/her opinion and should name some situations, which were obviously easy to observe and the student can remember. It is not for sure easy at the first time and both sides really do not know how the perception and assessment from the other one is – but this is exactly the reason behind. The teacher should give a feedback and some advice for personal self-development in an open dialog to the student. A lot of information and explanations were needed to run this process smoothly and it took several years to become successful.

The cooperation between a Chinese vocational training school and a German company attracted a lot of visitors around Beijing and neighbor countries. At least once per month, the management informed that it has to be cleaned very well. Unfortunately, the visitors arrived after the class was over. They rushed through the building, looked at sophisticated machines, and were not really interested in the new teaching progress.

A camera team from a local education channel showed up in the school and recorded an entire day. And they recorded live without any screenplay. Students were very proud to get filmed and gave their best for the shot.

The second time, a camera team which appeared had another focus. This time, the record was used for teaching material, which the school provided to the education market. It showed the development of the project; every single step was explained. At the end, the result was very attractive: students were set up in action, teachers were shown during explanation, and animations illustrated the production process.

The highlight in terms of records and media was a visit of certain students, teachers, and management staff at a local TV station. The Beijing Municipal Education Commission invited four former students to share their opinion about their experience they made during vocational training in different majors. Afterwards, a discussion about pros and cons was held. It was an open dialog between some school representatives and members of the education commission. They pointed out that the efforts of the government were done. They spent a lot of money in hardware and teacher education. They reformed the organization and opened new channels. Now, it is the common task for schools and companies to establish a new spirit in cooperation to achieve successful goals.

Besides media attention, the "pilot class" got management attention from the company. As a multiple-car producer, the company has a second production location in Fuzhou. The management team decided to bring the same vocational training system to an elected school at Fuzhou. Some representatives from the joint venture and the chosen school visited the running school at Beijing. Experiences were changed and the advantages of an action-oriented training were highlighted. After some deeper discussions, the German trainer supported two Fuzhou vocational training schools as well. There were two schools chosen because of the huge demand on students. In total, 12 teachers joined the education training program which was held during the summer vacation. Immediately afterwards, 150 students were recruited per school and divided into five classes. This is really a big advantage in China. There are no long planning phases; everything can be arranged in short notice and human recourses are always available. When a decision was made, the implementation is following straightforward.

Next to Fuzhou, the company set up cooperation with one vocational training school in Shanghai and Guangzhou to deliver after sales training for the dealer network. All processes were used from the assembly fitter "pilot class" in Beijing. The company extended the vocational training department, hired some additional staff to monitor the progress, gave on-site support to the schools, and handed over the curriculum. The job profile was named "car mechatronics" to ensure the quality of service and maintenance the cars.

The general education approach is split into two phases. For two years, students are in school, and in the third year, all students join an internship in the company. Especially in the plant, students are allocated to one department during that time. This is not the ideal case. A rotation after a period of time is much better, a challenge

HR departments are not prepared for. The company provides a monthly allowance to attract students and brand them. In the past and even at present, there is a war for talents in China. Good-educated and well-skilled young people are welcomed in each company, no matter what kind of major they learned. And it is not only a question of money. A lot of factors have to be borne in mind that youngsters stay in the company for a while. Where is the company located and does the company provides transportation? How is the reputation of the company? What kind of bonus will be paid? Is there a career opportunity? However, the HR departments should be alert that there is a new generation of job seekers on the market, and not every company is aware about these circumstances.

Although in the abovementioned case the same happened, students were determined to join a department for 1 year and learned more or less how to fulfill quantity. At the end that had nothing to do with learning anymore. It is not easy to change this mind-set of executives and will take a while until new management style becomes reality. Luckily, there was one big advantage for the company. Nearly all students grew up in remote areas of Beijing and the possibilities to find an adequate job were less. So all of them were happy to join the internship and earned a little bit of money, and the company promised a bright future. Right now, less than 1 % of former students quit the job after employment. This is really a good ratio during the last 8 years.

Besides some negative aspect, which is normal to usher a new era, all involved parties strived to give their best to make some noise in the market. The school invited all the parents to an "open house." The parents got the chance to see what their kids experience during daily routine. Different learning stations were created. Project learning and soft skills activities attracted parents as well as a test driving circuit. Everybody was proud to see kids' performance and a lot of pictures were taken.

To show the school the real holistic vocational training approach at the end of the third year, a practical examination was set up. During 8 h of work, the students had to produce a small project which covers all learned context. The entire day was recorded by a camera team. The students were divided in teams to use the machines and other resources in sequence. All machines, tools, and raw materials were prepared in advance and everything was in good condition. The teachers were a little bit nervous about students' performance. They suspected that a worse result reflected a bad teacher performance. But there is no doubt about it. Students worked fast and concentrated and everybody finished his/her task in time. After the evaluation of the German master trainer, the results were in a range between 78 and 100 points. Everybody was happy and proud about that and the good examination performance showed all parties that the first batch wrote actually a success story. Three years in close cooperation set up a milestone at least in the history of the chosen school.

The cooperation is still working, no matter in which city, and especially, the plants and dealers are very satisfied with the new educated young talents joining their business units.

Perspective

Time is running fast; meanwhile, a lot of money was spent, and finally, the small "pilot class" became a role model for vocational training in China. The government is satisfied with the successful implementation of a new education system. The participating schools can highlight a fruitful cooperation with a German car producer for self-marketing. The car company can offer attractive employment and ensure the high quality standards of their products. The teachers learned more in a various field and the German master trainer got rich in never expected experience.

It seems like a true successful story but there is no time to rest for each and everybody. The economy is still growing in China. New dealerships open frequently and new car models will be produced in the future. New employees with a deep knowledge and the ability to strive for lifelong learning are needed.

During the last couple of years, some good examples for a sustainable development followed. The company initiated a regular trainer support from Germany. A master trainer from a German technical training center spent at least 2 weeks in a Chinese vocational training school. Together with local teachers, they worked on a common project and repeated the "four steps method." Teachers acted as students under the guidance of the German trainer. Hereby, the focus was on the transfer from theoretical knowledge to action ability. This program is highly appreciated by teachers and school heads.

A second pillar to bring German spirit to China is a yearly student's exchange program. Two German apprentices stay for 2 weeks together with Chinese students in their school and generate a common project. The focus is aligned on communication and cooperation ability of the students. It was exciting to see, how fast they could work together, no matter how difficult the different languages are. One interested statement was given by a teacher: "It is fantastic to see, how well organized the German apprentices plan, execute and evaluate their work scope."

From time to time, some engineers from the plant production are visiting the schools and holding a lecture. But it is hard to find suitable persons to deal with students. They are definitely good educated but their wording is too sophisticated for students.

A good impact on daily routine had a so-called learning journey. Representatives from several cooperating schools visited, together with car producer's training staff, some technical training centers in Germany. During 1 week, they experienced different job profiles at different locations. The Chinese colleagues got convinced that the mixture of theory and practice is an essential part of a sustainable change in the Chinese vocational training system. They realized the necessity on good skilled workers with a better technical knowledge.

A lot of efforts were undertaken, a lot of words were spoken, and vocational training is in everybody's mouth, no matter in which field.

Now, it is on the Chinese society to continue in writing the story of success, not only for the economy, basically to provide a prosperous future for the youth.

Final Comments and Outlook

Years of implementation are gone, success is visible and now? To encourage a vocational education reform will be the essential project for the next couple of years. Therefore, learning from the good examples, implementing the holistic approach of learning/teaching in the entire vocational training environment.

It is not easy to convince all the involved ministries, institutions, schools, and companies to get in contact and try to change some educational principles.

It is cumbersome to find responsible persons who take the topic really seriously. Tasks have to be assigned to people who are not aligned with new ideas and concepts. Here is definitely the bottleneck in a sustainable approach. Bring passionate people together, educate them in a proper way, and reduce administrative barriers. Only people can make the difference and are able to change their minds which are necessary to change a traditional education system to become a modern dual education.