



## **Training the Trainer: An Integrated University/Industry Program of Improving Russian Industrial Trainers**

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The paper describes the experience of professional development for educators who work in the system of education at industrial enterprises in Russia based on 1) joint activities of the universities and partner enterprises, 2) research on the reasons for sustainable growth in demand for such programs, and 3) the evaluation of these programs and their influence on the career prospects of their students.

After the collapse of the Soviet Union in 1991, the system of professional development and training of industrial educators ceased to exist. The state stopped regulating this sphere of professional education activities. However, the Republic of Tatarstan (Russian Federation) stepped into this gap with a university/industry collaboration for professional development of the personnel doing training in industry.

Starting in 1994, Kazan National Research Technological University has been working in this field. The paper describes the changes of the program over the last 12 year period since 2001 when the University received state funding from the Ministry of Education of the Republic of Tatarstan to develop and implement the program. The biggest challenge was the absence of trainers who not only had the technical knowledge but also knew the most effective training and pedagogical methods. This problem is being addressed with a special program for first training the engineering university educators, and then disseminating that experience to the system of professional trainers as a whole incorporating differences in the adult audience and the professional goals of the students. The novelty of the program is in its content and modular character. The main units of the program are pedagogical, psychological, juridical (this is necessary for the Russian model of state and education), management of education quality, international standards and the peculiarities of the specific enterprise.

Assessment of the program has included opinion polls from both students and directors of the training centers at enterprises. Feedback from employers indicates that this program is very effective for improving the quality of the specialists training and increasing the number of specialists who successfully continued their careers at the enterprises after the training.

### **Introduction**

After the collapse of the Soviet Union in 1991, the system of training industrial trainers ceased to exist. The state stopped controlling this sphere of professional activities. However, the Republic of Tatarstan of the Russian Federation has accumulated an interesting experience of training the industrial trainers who teach the young workers and specialists on site and prepare them for their professional activities or adjust their skills to a specific production process. The successful development of this educational sphere is possible due to the new forms of collaboration between Kazan National Research Technological University (KNRTU) and industrial enterprises, where the graduates of the university are employed, and professional development programs are implemented. These programs are based on the systematic experience of training and professional development of engineering educators which started under the leadership of Anatoly Kirsanov in 1994 in the Center for Training and Professional Development of Educators. This center was created by order of the State Committee of the Russian Federation on Higher Education and is located at the Universities of the Volga and Ural Regions (hereinafter referred to as the Center),

According to the opinion of the Center founders, many Russian technical universities were being asked to give practical engineering skills to students but faced a lack of faculty with that practical technical knowledge. Furthermore there was an absence of knowledge on how to train the engineering university educators and industrial trainers. Thus key concepts around practical engineering pedagogy were developed and a special program for training the engineering educators was developed. The experience of the Center was disseminated throughout the whole Russian system of continued professional education. This experience included customized training for adult learners and a system of training the industrial trainers with deliberate trainees in training and continued development of the industrial trainers. A similar approach was used for expanding the participation of the university in the continuing professional education programs in the Republic of Tatarstan.

Today, the Center is the largest Engineering Education Center in Russia, comprising two Departments: the Department of Pedagogics and Principles of Higher Professional Education and the Department of Engineering Methodology. It is one of the leading Russian Centers for training and professional developments of engineering university educators. Thus, the University covers the whole spectrum of life-long learning, including pre-university training, university education and after the university professional development. The Center has developed a number of customized professional development programs which are in demand among the trainers and faculty from different Russian regions from Kaliningrad to Khabarovsk, who come to Kazan to participate in these programs. The center has over 20 programs ranging in depth from 72 to 102 hours and include:

- 1) “Engineering University Educator”,
- 2) “Innovations in System of Training Modern Specialists in Engineering University”,
- 3) “Innovations in Higher Education System”,
- 4) “Developing the Contents of Bachelor and Master Degree Programs”,
- 5) “Intensive Educational Technologies in the System of Bachelor and Master Degree Programs”,
- 6) “Character Education in Engineering University”,
- 7) “Qualimetry and Education Quality Management”,
- 8) “Innovation in Training the Professional Development Trainers”,

The Center does research in engineering education with the grants from different agencies. The Center has a dissertation council in “Theory and Principles of Professional Education”, and “Principle and Instruction Methods of Teaching Chemistry”. The Center participated in the University scientific journal “Herald of Kazan Technological University”, which is one of the leading Russian journals in pedagogics and psychology. In 1997, the International Society for Engineering Education (IGIP) licensed the Center to award the title of ‘International Engineering Educator’ (ING-PAED).

The Center has several times been a co-organizer of Russian and international conferences with participation from international professional and engineering educational societies. The multidisciplinary activities of the Center became a good foundation to develop a professional development system in the region and a unique regional model of continuing professional education.

It is well known that the majority of the industrial trainers at enterprises are highly skilled in their technical fields. However their skills in teaching are low and they cannot plan classes and organize a good interaction when teaching the young employees. They do not know well

the peculiarities of the adult psychology without a special training. Moreover, these trainers always need new knowledge in legislation and new information technologies.

Due to the experience of the Center and the systematic scientific research on the problems of adult learning, a new approach to training the industrial trainers became possible. The Institute of Additional Professional Education of Kazan National Research Technological University (KNRTU) used this approach. In 2001, the University got a grant from the Ministry of Education of the Republic of Tatarstan to develop and implement the program of training the educators and industrial trainers. The program was developed by the Professors Iskander Kuramshin and Michael Rogov. of the Department of Engineering Pedagogics and Psychology. This program was necessary due to the demand of the enterprises in the Republic for professional development of the industrial trainers. Two groups of the industrial trainers (50 people) participated in this program, and then disseminated information about it among other enterprises and trainers.

The complex problems in continued professional development are related to the adult learners, specific contents and objectives aimed at. The professional development services are of a high social value, however, it is always hard to choose the proper teaching methods and result control forms. The advantages of the professional development programs are their short duration, different possible methods and forms, flexible schedule, active teaching methods and new technologies used. At the same time, the quality requirements are very high. Thus, the characteristic features of the additional education programs are: flexibility (adaptability), integrity, diversity, autonomy, multiple level system, information and organization openness, affordability, and mobility. Taking into account all the above listed factors, the program for training the industrial trainers was developed. The program is novel in its contents, modular character and possibility for the industrial workers to participate in it themselves. The basic modules of the program are: pedagogical, psychological, legal (this is necessary in the conditions of the Russian model of the state and education); quality management based on the international standards and peculiarities of the industry, and etc. The program includes the invariable and the variable parts.

The invariable part includes the following modules: *Legislation for additional professional education, Pedagogics, Psychology, Information Technologies*. For example, the *Pedagogics* module studies the issues related to the contents of training the trainer, methods and techniques of practical teaching, organizational forms and principles of teaching, modern educational technologies and the basic principles of preparing and giving classes in additional professional education. The *Psychology* module includes the issues of social and psychological interaction of adult learners, a special attention is given to social and psychological trainings with elements of discussions and case studies.

The variable part of the program includes the practical issues related to the activities on the given organization. As a rule, the following issues are studied: standards for enterprise and quality management, personnel management (development of human resources), work with young employees, attestation of specialists, rules of industrial safety, and organization of industrial placement for university students. Starting in 2003, the Institute of Additional Professional Education implemented the programs of training the industrial trainers. There is a stable demand for these programs from the industrial enterprises. Despite the economic downturn of 2008, and a number of other factors, KNRTU trains 50-90 industrial trainers every year. The employers consider this program as a very efficient one. The indicators are:

the improved quality of training the workforce and the increase in the number of workers who remained at the enterprise after the program. Other customers for these programs are the municipal authorities who are in charge of regional employment.

The motivation to teach the personnel of the partner enterprises together with the university can be explained by the need in professional development and good results of the program. The results of the polls show that the program gives good results.

As an example, the results of the 2012-2013 academic year program polls are given. The program participants and the leaders of the industry training departments were interviewed. The interviews gave the following results.

1. Have you obtained a lot of new information during the program?

a) Almost all information was new for me.

b) I knew some facts, but most of the information was new for me.

c) I knew almost everything; however, my knowledge was structured in the course of the program.

d) I did not learn anything new.

The majority of the program participants chose the “b” answer.

2. Name the modules or parts of the program which were underdeveloped and did not meet your requirements.

None of the program participants could name any module or part.

3. During the program, the adult learners could get expert advice on the practical cases they deal with in their routine work. 100% of the program participants answered that the advice was very useful and highly professional.

4. According to the opinions of the participants, the main results of the program are:

- personal enrichment and new knowledge (80%);
- theoretical and applied knowledge, psychological and pedagogical approaches which can be used in professional activities (65%);
- career prospects (20%);
- well-structured knowledge (35%);
- new contacts with the specialists to be addressed for expert advice and expertise in the future (15%).

5. Was the program useful for you as a professional? Did it help you obtain the missing knowledge and skills?

Program participants chose the “yes” (55%) or “partially” (45%) answers.

The main proof of the program efficiency is its stable demand. In 2010, the number of the program participants was 66 people; in 2011, 25 people; in 2012, 81 people; in 2013, 85 people. The following large enterprises always participate in the program: Kazan Synthetic Rubber Plant, Nizhnekamskneftekhim, Tatneft-Neftehim, and KAZANCOMPRESSORMASH.

Unfortunately, there is no tradition to continue the communication with the participants after the program finished and to follow their professional careers. Therefore, it is not possible to give any statistics regarding the changes in their careers after the program.

The industrial trainers know much better than the university professors what kind of workforce is needed to improve the production quality and the efficiency of labor. Due to additional classes within the above named program, the industrial trainers can train the workforce on site. Every enterprise makes its own decision as for who should be the trainer. For example, Kazan Synthetic Rubber Plant sends engineers and technical workers for the program including production supervisors, heads of departments, shifts, units, laboratories and etc. The same approach is used in the Employment Center of the City of Mendeleevsk, and Karpov Chemical Plant, who add power engineers, chemical engineers and other engineering specialists to the groups. The affiliates of GAZPROM also have a right for their own corporate personnel policy: some of the affiliates send specialists of all levels to the ‘train the trainer’ program, the Kazan affiliate group was made up of the industrial trainers and heads of departments responsible for the strategic development of the affiliate. The workforce of KAZANCOMPRESSORMASH was equally represented in the ‘train the trainer’ group.

The main long lasting partners of KNRTU at all levels of education, Nizhnekamskneftekhim and Tatneft-Neftehim, have very good educational structures which represent the interests of KNRTU at these enterprises. Therefore, the students from these enterprises at the ‘train the trainer’ programs are always eager to improve the quality of the enterprises and to train well qualified specialists. The program is always very highly evaluated by the students although not all the graduates see a direct relation between the program and promotion or salary growth.

In most cases, the men/women ratio among the program participants is 50/50; however, women make almost 100% in the groups from Tatneft-Neftehim company.

In their interviews, the leaders of the training departments of Nizhnekamskneftekhim (Andrey Nikolaev), Tatneft-Neftehim (Dinar Khusainov), and KAZANCOMPRESSORMASH (Michail Paltsev), say that, despite all the advantages of the program, participation in it does not influence career development. They also recognize that the Institute of Additional Professional Education is very flexible in meeting the requirements of the customers, e.g., the “Philosophy of Education” module was excluded from the program for Nizhnekamskneftekhim: despite the oratory and pedagogical skills of the lecturer since the program participants claimed that this module is not necessary for them. Another example, after the new law “On Education” was passed in the Russian Federation; principal changes were introduced to the legislation module of the program. After program participants were interviewed in 2012, certain changes were made for the teaching and learning materials; and e-learning technologies were introduced.

Unfortunately, the majority of the enterprises are not systematic in professional development of their workforce. Unlike the universities, they train their workforce from time to time. There is no direct scheme for professional development of the workforce with well calculated annual costs. At the same time, the industrial trainers at enterprises make a very huge number of specialists: from 100 at KAZANCOMPRESSORMASH to 1200 at Kazan Helicopter Plant. They form the educational environment at the enterprises and the culture of lifelong learning. Although Russian legislation dictates that the employee himself determines the necessity of professional development, the enterprises should have a well formalized system of training and the universities can show a good example. Moreover, the university often faces the need to change the program contents taking into account the customer requirements. Thus, some very important topics are withdrawn, such as education ethics, education

philosophy, oratory art, and etc. The program should also include the classes from the leading professors and practitioners.

The university also wants the employer to evaluate the results of the workforce participation in the program, and their practical implementation in the everyday activities and send the best students to the university for the 72 hour Programs. In this case, the whole University infrastructure can be used including the modern information technologies, libraries, and laboratories. The Institute of Additional Professional Education of KNRTU is ready to give regular workshops for the industrial trainers, and they can be further credited for the professional development programs.

It is expected that the new vector for the development of the system of professional development and training the industrial trainers is the participation in the Presidential Program of professional Development for Engineering Workforce for 2012-2014. This program requires a new approach to training the trainers. Within the program, the leading professionals from the enterprises visit the universities or the industrial enterprises where they want to share the experience. Purdue University became one the foreign partner Universities. The university faculty members have a different attitude to these programs, and they also want to participate in the 'train the trainer' program themselves. Therefore, KNRTU made 'capital investments' by sending the faculty together with the industrial trainers to the leading international centers. We see that these programs can further develop.