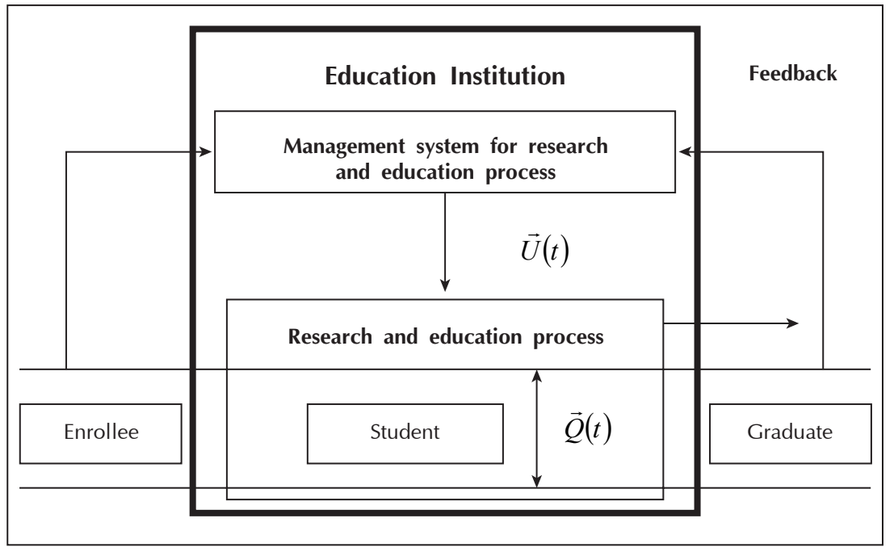
Fig. 2. Quality model for engineering training [3]



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Yakutsk State Academic Olympiad in Technical Drawing – 50 years

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The article is devoted to the current teaching problems in technical drawing in the schools of Sakha Republic (SR) (Yakutia), involving the 50-year background experience in organizing and conducting olympiads in technical drawing. The pedagogical achievements of the technical drawing teachers and olympiad winners have been described.

Key words: technical drawing, graphics problem-tasks, school, individual approach, out-of-class activities, Olympiad in technical drawing.

Since 1962-1963 school olympiads in technical drawing were organized and conducted under the supervision of N.S. Nikolaev in the Sakha Republic. The 50th Olympiad Anniversary was conducted in 2015.

The idea of conducting school olympiads in technical drawing started up in the 60s of the last century to improve the school teaching quality of technical drawing, as well as advancing teaching and learning standards in this subject.

What are the advantages of olympiads? It is a well-known fact that school-teaching should not be restricted only to in-class learning. Extracurricular activities are introduced to reinforce and increase student knowledge and skills obtained during classroom activities. Such activities reveal such aspects as student orientation, personality qualities, creativity ability and versatile interests. Extracurricular activities should be diversified, and, only in this case, a teacher would be able to win both recognition and authority. An interesting extracurricular activity is the olympiad, the target of which, is to identify and develop student interests and abilities and evaluate class and out-of-school activity results in this or that subject for an academic year. Another important aspect includes pedagogical issues. For example, initiating friendly ties and establishing business relations with different schools, regions, districts and republics. In the days of olympiads students do not only compete, but also help each other and intercommunicate.

Olympiads are both a popular type of student assessment and achievement and a tool in advancing the role and significance of this or that subject. New and new student groups are becoming involved in the subject after such competitions. Experienced technical drawing teachers (Yakutia) have proved conclusively that the fruitful efforts of olympiads flourish only under conditions of systematic out-of-school activities or become the starting point in their development. Excluding these factors could convert olympiads into simple go-to meetings without any benefit or results.

Every teacher knows that children strive for autonomy- a desire to try themselves in revealing their own creativity and to explore everything on their own which is typical for their age. However, this inherent motivation can not always be acceded within the framework of academic classes, while olympiads enhance more possibilities and broad options. Often students more distinctively and clearly reveal their individuality, demonstrate their personal characteristic traits and their own way of thinking when competing. Observing how

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students compete in olympiads could be interesting for a serious-minded teacher, i.e. could provide observation material. After olympiads round table discussions are conducted to share ideas and experience and to outline the possible paths in eliminating the existing gaps in the learning process itself.

As teamwork-based environment is typical for any subject olympiad, it could also be an important motivation element in teaching school students to participate and work in teams.

It should be mentioned that our Olympiad not only improved the teaching level of the subject- technical drawing and established new technical drawing classes, but also enhanced such student qualities as self-discipline, responsibility, commitment and autonomy. It is these olympiads that promote the training of present-day specialists in technical drawing.

What is the background? Numerous fundamental and timely papers in technical drawing were published in Republic newspapers by Yakutia State University senior lecturer N. S. Nikolaev (now professor of North-Eastern Federal University). These papers were devoted to the role and significance of technical drawing in the scientific-technological progress age. It should be stated that these papers advanced the further development of technical drawing (graphics) education in the Republic schools.

In 1956 Nikolai Spiridonovich Nikolaev graduated Moscow Printing-Publishing Institute (Mechanical Engineering Department) and became the first Yakutai mechanic-engineer, specializing in "Printing Equipment and Automated Complex." He moved to Yakutsk and began his employment career as mechanic-engineer in printshop, Yakutsk Republic Printing House (later, Acting Chief mechanic). In September, 1956 Yakutsk Sate University was founded, embracing technical (then, engineering -technical) department where Nikolaev started his part-time teaching in descriptive geometry and mechanical drawing for students of Mining and Geological Prospecting Faculty of Engineering -Technical Department, Yakutsk Sate University (North-Eastern Federal University n.a. M.K. Ammosov). He started from scratch- at that time there was not a single teacher in the education establishments (schools, technical colleges, technical high schools, etc.) having tertiary education in technical drawing within the Republic (Yakut Autonomous Soviet Socialist Republic).

Teaching technical drawing as a subject in schools was at a very low level: students skills and abilities in technical drawing did not meet the school program requirements. Nobody paid attention to this fact.

This could not go on. It was necessary to "overstep" this situation. Young engineer Nikolaev managed to convince many domestic education association workers in the Republic including Dep. of Ministry, inspector of Board of Education (Yakut Autonomous Soviet Socialist Republic), Local Education Authority, Yakutsk State University, etc. to change this situation.

Today, due to his multifarious activities, engineer Nikolaev (Hon. Veteran of NEFU, Hon. Professor of Education and Professional Development Institute, Correspondent Member of Russian Academy of Engineering, Laureate of Russian State Prize in Science and Engineering; author of 40 books and manuals published in Moscow and Yakutsk), promoted technical drawing teaching in all Yakutsk education establishments (schools, institutes, etc). Another important fact was that this subject was taught by specialists with higher vocational education (85%) and vocational secondary education (15%). Those that taught or are teaching technical drawing in Sakha Republic (Yakutia) involve one academician (full member of Russian Academy of Education), one academician of Petrovsky Academy of Science and Art, one correspondent member of Russian Academy of Engineering, 10 order bearers (including one Companion of Order of Friendship), 8 Companions of Gold Medal

of Academician n.a. V.P. Larionov, 2 Hon. Teachers of Russian Federation, 9 Hon. Teachers of Russian Academy of Education, about 40 exemplary teachers of RF Education, Russian Academy of Education, 2 professors, 8 PhD and associate professors (pedagogical and engineering science) and other eminent specialists. Such teaching staff employment growth in technical drawing throughout Yakutsk and other regions of the Russian Federation is unique.

No wonder that the Education-Methodics Department, USSR Board of Education studied and discussed the experience of Yakutsk school Olympiads in technical drawing. Associate professor of Yakutsk State University, N. S. Nikolaev (1975, 1978) was the keynote speaker. This Department accepted special resolutions to advance Yakutsk experience.

Professor Nikolaev organized and conducted more than 50 Republic (State) school Olympiads in technical drawing during this period. Professor Nikolaev was Chairman of Republic Olympiad jury. More than 180000 school students from more than 300 schools of 32 Republic regions (settlements) participated in these Olympiads, among which 234- champions, 361- silver prizewinners, 536- bronze prizewinners and 531- 4th (top places), i.e. all in all, 1662 were prize winners. Howling success! More than 29 settlements, including 484 school students from Megino- Kangalasssk region- first place among regions. Second place among regions (248 winners) – Yakutsk. Third place (182 winners)- Ust- Aldansk region. Fourth (106 winners)- Tattinsk region, fifth place (99 winners)- Amginsk region, sixth place – Verkhoyansk region (cold Pole, one of the most northern regions! That's great!!!). We are glad that there are representatives from the northmost (tundra) Yakutsk regions, for example, Bulunsk region- 4 (1- winner, 3- bronze winners), Ust-Jansk region (1 champion, 2 bronze prize winners) and Anabarsk region – 1 winner, etc.

Many Yakutsk Olympiad winners in technical drawing have become leading statemen, for example, A.V. Migalkin (PhD in Philosophy) worked as RF Consul in Mongolia for many years; S.N. Nazarov worked as leading architect in Yakutsk; others- minister of Construction and Architecture (SR), Home Secretary (SR), Deputy PM (SR), First Deputy Prime Minister (SR), Chairman of the Government (SR), etc.; some worked as Under-Secretary of Ministries (SR),executives of industrial enterprises, etc.

Among Olympiad winners in technical drawing there are also scientists and academicians of world reputation, such as N.I. Germogenov, T.T. Savvinov; well-known engineers, architects, designers, etc. For example, one Olympiad winner is working as a designer in one of near Moscow production facility enterprises. We cannot disclose any information about this person. Another interesting fact is that one Olympiad winner worked at Baikonur, but now is retired.

During the last few decades a galaxy of talented people have emerged from teachers of technical drawing- not only engineers, architects, scientists, statemen of Yakutsk and Russia, but also distinguished innovative teachers, authors of books and manuals. It has been established that the authors of three manuals in technical drawing, published in Moscow Publishing House "Prosveshenei" have been approved by the Ministry of USSR Education: Yakutsk teacher V.N. Okoneshnikov (Technical Drawing Class, 1984, Moscow); N.S. Nikolaev (Conducting Olympiad in Technical Drawing, 1981 and 1990, Moscow) [2]. Book by professor N.S. Nikolaev (co-author) "Yakutsk: Records, the First, the Only"(Yakutsk: Bichik, 2004, copies 15000) - topped the first place in Russian Book Competition in 2004. This is saying something! The total edition is 138000 copies! This is quite a lot! Yakutsk authors (about 30) wrote about 80 manuals in technical drawing (including dissertation abstracts, PhD thesis), the total edition of

which is 250000 copies, pages – about 500 printed sheets, including newspaper and journal articles, as well as articles printed in collections, books, posters, etc.

From the days of professor Nikolaev [1] a new generation and enthusiasts fortified by initial successes are emerging. It is encouraging that practically all school technical drawing teachers in Yakutsk (SR) have been professor Nikolaev followers.

We, teachers of technical drawing, descriptive geometry, engineering graphics of Yakutsk education institutions are proud of the fact that N.S. Nikolaev has been entitled one of 2900 Russian leading scientists and specialists in 2007- this can be found on Internet- encyclopaedia of Russia (www. famous – scientists.ru/1158). This is really true recognition- professor's achievements in Russian science. He received the badge "Eminent Scientists of Russia" and certificate INTERNET-Encyclopaedia "Eminent Scientists of Russia" (Sochi, 2007).

Professor N.S. Nikolaev was elected Russian Academy of Engineering delegate of the 1st Russian Congress of Engineers, which was held in the Kremlin Palace (Moscow, 2003). In May, 2004 he was invited to participate the 5th Forum Of World Engineers (Earth), in Paris (France).

Now there is a saying that "If you are a Yakut, you are a good drafter." This is the result of the gigantic work of all professor Nikolaev's followers. This is recognition of his service and works!!!! Professor Nikolaev in Yakutsk established his School (Nikolaev School). We have only briefly described the first achievements of this School.

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Engineering Staff Training – Issue of National Concern

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The article examines the quality of engineering education. It underlines the urgency of:
- implementing system policies regarding engineering education;
- introducing preferential treatment and incentives to the enterprises which are planning to contribute to engineering staff training through the cooperation with universities.

Key words: quality and professionalism, engineering education, industrial enterprise, national policy.

Mining industry creates a foundation for development of the manufacturing sector and strengthens the defense potential of the country. Through colossal common effort, Yakutia produced 116 tonnes of gold and more than 8000 tonnes of tin metal during World War II. Back during those years, gold of Yakutia, having become a strategic reserve of the country, was used to lease 80 thousands of fighting vehicles.

As reported in archival materials, the first gold mines of the well-known Lensky gold district were discovered in 1846. In 1898, 976 miners worked in the gold mines of Yakutia. In April 1923, by the decree of the Yakut Autonomous Soviet Socialist Republic, gold mining entered a new age when the first Yakut gold mining company led by Voldemar P. Bertin was established. On May 1, 1923, 18 staff members began their work in a remote taiga area and off-road conditions. In 1931, the state trust company "Yakutzoloto" was founded. Within two years the company's staff was equal to 14 523 people, with 6943 employees working in mining sector. In 1957, the "Yakutalmaz" trust company was established.

The backbone of modern mineral resource base of Yakutia was formed in 1950-70. However, a major breakthrough was achieved in 1974 as a result of the official visit by the Chairman of the Council of Ministers of the USSR A.N. Kosygin. Thus, in the Republic of Sakha (Yakutia), annual volume of mining in 1973-74 made up 4.5 tonnes of gold [1].

In the global context, there are only 10 countries, each of which mines more than 30 types of mineral resources. It is a well-known fact that development of mining industry is directly dependent on the amount of mineral resource extraction (Fig.1), precisely, the number of mineral resources types. The estimates of mineral resource production across the countries demonstrate that USA (15.8%), China (15.4%), and Russia (9.7%) take the leading position. In 2005, together they accounted for 41% of total world mineral reserves. It is worth noting that mining in the Asian part of Russia produces 33 types of mineral resources, and it would play an increasingly important role through the rest of the century. It is due to the fact that the most precious and valuable mineral deposits are found on the Asian part of Russia. However, there is lack of total staff resources [2].

Trying to meet the accreditation requirements, Russian universities have put special emphasis on the quality of training

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