

RUSSIAN ASSOCIATION OF STATISTICIANS: FILLING THE GAPS IN THE EDUCATION CHAIN

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ABSTRACT

Typically, training in Russia for professionals includes school, university, and postgraduate education. People make their choice regarding university or job after school, and they choose jobs after university. These are very sensitive matters. Help in making the right choice is a real asset. The Russian Association of Statisticians (RASt) is an independent, non-profit organisation that does not provide statistical education as a university and does not collect and process data as a statistical institution. But RASt helps students, universities, and producers of statistical data find each other. The paper describes the activities of RASt which organises the school competition in statistics called “Trend” to support students in choosing a profession and the kick-off competition “Career” for university students to help them get to know their employers. The organisers of the competition for school children usually face a number of problems related to the young age of participants and to limited funding. If we are talking about such a country as huge as Russia, the problems increase. To solve these problems, organisers use a combination of competition of presentations about original statistical researches provided by school teams in regions and an online quiz on statistical topics at the final stage. Technologically, the entire process is supported by ROSSTAT with its IT network. The organisers hope that the competition will make the profession of statistician more popular in Russia and attract more students to statistical programmes in universities.

Keywords: *Statistical education, School competition, Federal State Statistics Service, Russian Association of Statisticians*

1. INTRODUCTION

Statistical data and statistical approaches are used in a wide range of fields, thus making statistics a universal science. Statistics begins to be studied at school, continues at universities, and then, the acquired knowledge is improved throughout life. This is the traditional chain of statistical education, with the various links being implemented via the different educational units. The most difficult moments for students are the transitions from one stage of education to another. At school, students acquire a basic knowledge of statistics, which is usually limited in Russia to the concept of probability, the Law of Large Numbers, the normal distribution, and sometimes indices. But, unfortunately, the students do not always understand where and how this knowledge can be applied. After graduation, they have to make a difficult choice between different universities and other educational programmes. If everything goes well and the student

gets advanced knowledge in one of the fields of statistics at university (it can be mathematical statistics or applied statistics in economics, medicine, engineering, etc.), he or she has to make a difficult choice again in searching out where this knowledge can be applied.

Unfortunately, schools do not have to assist their graduates in this choice regarding universities and programmes, and universities do not always help young professionals and employers find each other. Thus, the educational chain may be broken. To prevent this, the professional community should help young statisticians by supporting events that help school students decide on their future profession and university graduates find their employers.

A good example of such activities is the ISI project on statistical literacy, which includes various competitions for school children and university students. At the national level, this function is performed by national professional associations of statisticians. In Russia, this role is played by the Russian Association of Statisticians (RASt). RASt is not an educational institution; it is a professional association that supports statistical education in the country but is not involved in teaching. Thus, the role of RASt is to organise the event and encourage educational institutions to participate in it.

This article describes in detail the school competition on statistics, “Trend”, which is an event that helps school students to understand the content of statistical activities, to see how professional statisticians work in the national statistical service in their home region, and to try to perform some typical statistical works on their own. “Trend” is not the only RASt activity in the field of statistical education and training. The article also describes the plans of RASt to organise a special competition for young statisticians to help them find a workplace after graduation. A new project will be launched in 2020. This is a kick-off competition for university students, called “Career”, designed for the communication of potential employers with graduates of statistics. This event will complete the RASt mediation mission between all those stakeholders involved in the statistical education process.

This article is an extended version of Ponomarenko and Svirina (2018).

2. GENERAL COMPETITION ORGANISATION

The organisers of the competition for school children usually face a number of problems related to the young age of participants and limited funding. If we are talking about a country as vast as Russia, the problems increase. In this chapter, the problems of organising a school competition in statistics in Russia are discussed, and possible ways to solve them using modern technologies and approaches are shown.

2.1 PURPOSE OF THE COMPETITION

Since the academic year 2017/18, RASt in collaboration with the Federal Service of State Statistics of Russian Federation (ROSSTAT) and several universities conducts an all-Russian annual competition in statistics for school students, called “Trend”. All the institutions have their specific reasons for this joint project. RASt is committed to improving the statistical competence of the public, as this is its declared strategic goal. ROSSTAT is interested in making official statistics attractive to future talents, and universities prepare potential students for university studies.

Typically for the Russian Federation, academic competitions of various kinds are widely used among students aged 11–16 years as a method of identifying talented children under the supervision of high-level universities. Some of them have the status of Olympiad as recognised by the Ministry of Education of the Russian Federation. This status usually gives the winners the possibility to guarantee enrolment without examinations at the universities. Another type of competition – namely an academic competition – enables the winners to apply for a student scholarship in the future. These are academic competitions that are held at various territorial levels, from municipal to national and international levels. There are many competitions in arts

to identify children talented in music, painting, or, for example, dance. In-depth analyses of the importance and positive impact of academic competitions of various types and levels on the promotion of “gifted students” and the educational system in general in Russia are found in Yurkevich and Davidovich (2009) or Shatunova and Sergeeva (2014).

In contrast, the all-Russian school competition on statistics “Trend” is a tool aimed at improving the statistical literacy of children on a broad basis and at stimulating their interest in the profession of statistician by disseminating information about its importance, achievements, and work-related potential for creative and professional growth. According to its basic idea, “Trend” is quite similar to the Eurostat Statistics Olympiad. A description of this European Olympiad can be found in Vinuesa (2017). In this way, “Trend” is aimed at the early vocational orientation of young people. As an additional bonus, the winners of this competition are awarded an entry in the state register of talented children. Children entered in this register have the right to apply for a special scholarship from the president of the Russian Federation after entering university. The size of this scholarship is approximately \$330 per month, which is a significant support for young people in training. Maybe some of these children will work for ROSSTAT later on.

In view of the common interest in increasing literacy in the field of statistics, RAS together with ROSSTAT considered it very important to jointly organise the competition for school children in statistics. The competencies between the two institutions are distributed as follows: RAS assumes the role of the competition organiser, develops tasks, opens and maintains an Internet site, and takes care of the award ceremony and communication with the Ministry of Education. Through its regional offices, ROSSTAT helps to organise interaction with schools, especially in remote areas, organises excursions and consultations, helps children prepare presentations, and uses its technical facilities to carry out the online quiz in the final phase. In addition, both organisations have their representatives on both regional and federal juries.

At present, the system of statistical education in Russia is undergoing significant changes. Almost all components of the educational process are being reformed. These reforms have primarily been caused by the changed perception of statistical activities in society and by the demands made by society on statisticians:

- In 2015, the new Professional Standard “Statistician” was accepted in Russia. It consists of a set of skills for professionals in data collection, processing, analysis, and methodological preparation in any field of activity, including economics, finance, science, medicine, etc. This Professional Standard corresponds to ISCO 2008 and the associated Russian professional classification.
- In 2016, the version of the Russian Classification of Education was amended and statistics, as a special field of education, was included in the same group with mathematics in a similar way as in the International Standard Classification of Education and ISCO 2008.
- In 2016, the Educational Standards for bachelor’s and master’s programmes in statistics were also accepted. It consists of a set of disciplines to provide skills and abilities listed in the related Professional Standard.

These standards correspond to the new classification and professional standard of a statistician and include a series of training courses that are necessary to teach the skills at a professional level. At present, several Russian universities are working on designing bachelor’s and master’s programmes in accord with the new standard. But to recruit enough students for new programmes, it is necessary to do some work among the schoolchildren and explain the new approaches to teaching statistics. Therefore, universities are highly interested in ensuring that as many potential students as possible participate in the school-statistics competition. The changes in current statistical education in Russia are described in Ponomarenko (2017).

The universities prepare competition tasks for “Trend”, participate in the evaluation of the presentations, and advise students and teachers. At present, St. Petersburg State University of Economics is the most active; it is responsible for the methodological component and the

content of the competition. Other partners in the competition are the Moscow Centre for Continuous Mathematical Education and the Laboratory of Probability and Statistics.

All the institutions participating in the statistical competition want to upgrade its status to an all-Russian Olympiad in the future in order to prepare potential students and serve as an enrolment criterion at universities for the most talented students.

For a better understanding of related limitations, it is necessary to say that “Trend” is a voluntary project. ROSSTAT and the universities do not spend any funds on its organisation. RASt finances the website, the silver awards for the winners, and some other expenses, with the exception of salaries or other compensation. All others (professors, managers, jury members, and teachers) work for free. There are no funds for business trips or the organisation of lessons or examinations in class. This is a strong reason for the objective limits of the competition and speaks in favour of a wide use of online technologies for communication.

2.2 COMPETITION PROCEDURES

“Trend” is organised in two rounds. The first round is carried out at the regional level by RASt in cooperation with ROSSTAT regional offices. All information about the competition is available on the website of the All-Russian School Competition in Statistics (n.d.). All necessary documents are available there, including *The Regulation of Competition* and *The Rules of the Contest* (both documents are officially registered with the Ministry of Education), a description of the objectives of “Trend”, news, information about the organisers, contact persons in the regions and in Moscow, recommended literature, and personal reports of past participants.

To participate, candidates should open a personal account. Usually this is a function of the teacher who registers himself and the children’s team (up to five participants). In Russia, the basics of statistics are usually taught at school in mathematics lessons (combinatory, the concept of probability, and some elementary rules of construction of tables and graphs). Basically, the teams are organised by mathematics teachers. In practice, however, teachers of other disciplines that are not directly related to statistics can also be found. So, it is more about the enthusiasm than the expertise of the participants. During the registration, children have to choose one of two options for participation in the competition:

- (1) “Learning to collect statistics” requires a survey to be carried out at school or in the neighbouring district in order to obtain statistical data and prepare a presentation. The subjects of these surveys change from year to year. In 2017/18, it was “Portrait of my peers”, in 2018/19, “What do my classmates want to become?”, and in 2019/20, “What small business could you start in your area after graduation?”
- (2) “Learning to analyse statistics” requires the analysis of data from the official websites of ROSSTAT regional offices.

As a result of a regional round, participants prepare their presentations, which are evaluated by a jury consisting of experts from regional statistical offices and professors of statistics from local universities.

In the second round, the winners of the regional competition take part in the all-Russian online quiz on statistics organised from Moscow. Actually, there are two stages in this round: the qualification stage and the final stage (the online statistical quiz itself).

In the qualification phase, the central jury selects ten participants from the winners of the regional round, based on video presentations of the results of their research in all participating regions. The preparation of video presentations of the winners of the regional round is carried out with the support of local universities, the regional offices of ROSSTAT, and RASt regional offices. Thanks to the headquarters in Moscow, which carried out all the necessary administrative procedures, there were no problems with respect to cooperation between the ROSSTAT regional offices and the “Trend” participants. In practice, there is great enthusiasm among professional statisticians in all regions to support their young followers. The schools are supported by advices in the organisation of presentations and are provided with cameras, along

with other specific equipment. The video presentations are published on the competition website in the personal pages of the participants. Most presentations are based on the results of original school research conducted by the participants within the “Learning to collect statistics” option.

The final phase takes the form of an online quiz via the ROSSTAT Internet network. The school teams are located in the regional offices of ROSSTAT while the central jury is located in Moscow in the ROSSTAT building. For example, the jury in 2017/18 included the ROSSTAT’s head and his deputy, Dr Shyam Upadhyaya (Nepal, Head of UNIDO Statistical Department), Dr Maria Vinuesa (Spain, Representative of the European Statistical Olympiad), Alexandr Horoshilov (Head of the UNESCO Institute in Moscow), representatives of the Ministry of Economic Development and the Ministry of Education, professors of statistics at the Higher School of Economics (Moscow), and the Universities of St. Petersburg and Novosibirsk (online).

During the video conference, the ten participants take part in an oral quiz on statistical topics. The winner is determined by the maximum number of points. The results of the competition are forwarded to the Ministry of Education and Science of the Russian Federation. Based on these results and provided that the winners will enrol at the university in the future, the Ministry will give them the opportunity to apply for the above-mentioned scholarship of the president of the Russian Federation.

In addition, some of the winners of the qualifying phase of the 1st round of the competition may be awarded special prizes donated by the Ministry of Economic Development, ROSSTAT, and UNESCO. For example, the Ministry of Economic Development of the Russian Federation has prepared a book on the economic development of the Russian Federation in 2017, which was signed by the Minister Maksim S. Oreschkin. The work with research on Internet security was awarded the special prize from UNESCO. All other laureates also received special prizes, e.g., CDs with a statistical encyclopaedia, a statistical handbook, or a book on the history of Russian statistics. These prizes were in line with our main mission of increasing the statistical literacy of the pupils.

2.3 COMPETITION SCALE

In total, the Russian Federation includes 86 regions. In 2017/18, 112 schools in 24 regions around Russia attended the competition with 320 registered participants; this can be considered a success. The winner was a team of young statistics enthusiasts from a small rural school in Siberia. At the 2018/19 competition, we had 99 schools with 256 registered participants from 26 regions. Thus, there were more regions with a smaller number of participants. For 2019/2020, we have 135 schools with 344 registered participants from 29 regions. This is a significant increase, but we understand that we must cover even more regions in order to make the competition truly all-Russian.

We do not know exactly who usually initiates the participation of the school team in the “Trend” competition. It may be the students themselves who are interested in statistics due to the popular “data revolution”, or it may be the teachers who are encouraged by the school administration to participate in various competitions to improve the school’s rating. But we understand that the key to success is direct contact with teachers because most of them actually have very little experience in teaching statistics. To establish this contact, webinars for teachers from regional schools were organised, which were attended by professors from leading Moscow universities and “Trend” administrators. Another form of contact is the organisation of field seminars for the teachers in the regions. This is a more expensive and more time-consuming method, and this is a problem given that the entire “Trend” team works as volunteers. In three years, only three field seminars for teachers were organised. Even though, each of them was attended by 20 to 50 teachers, such seminars were the most effective. The regions where the seminars were held showed the largest increase in participants.

We invited Reija Helenius, Finland, Director of the International Statistical Literacy Project, to visit St. Petersburg to participate in the RASSt Congress in February 2020. We are very grateful to Reija for agreeing to come. During her visit, we will organise a master class on statistical literacy for local school teachers. We expect that this will result in a significant increase in the number of participants from St. Petersburg in the “Trend” competition.

Initially, students mainly from remote regions participated in the “Trend” competition. Moscow school children are “spoiled” by their proximity to prestigious universities. They can participate in face-to-face competitions in various professions. Only in the third year of the competition did the first three students from Moscow register on the website. Thus, currently the list of participants includes teams from both of Russia’s biggest cities (Moscow and St. Petersburg), the Far East region, Siberia, Ural, and various other regions, from big cities to towns and villages. We believe that this indicates an increase in the rating of the “Trend” competition. Not all teams that have registered on the site actually present their work to the jury. In 2017/18, only 76 papers were submitted from 112 schools (68%). In 2018/19, this share was only 63%, but in 2019/20 it increased to 78%. Perhaps, this is because initially the competition seemed to participants to be an easy game. But statistical analysis of actual data, and especially the collection of primary statistics, is a complex process that requires a lot of time and effort from the participants. Not all participants reach the finish line. At the same time, if a certain school participates in the competition from year to year, experience is accumulated, and the organisation of statistical work is improved. Some teachers take part in webinars and seminars and thus begin to better understand the idea of the competition. We do not expect all registered teams to submit their works in the future. A competition is a competition, and there will always be a dropout. We are, however, working to make participation in the competition more conscious from year to year.

3. COMPETITION CONTENT

This chapter describes the content of the competition both at the regional and federal levels. The principles and limitations for the formulating of tasks are articulated, and examples of questions for the online quiz are listed. Taking into account the vastly different backgrounds of the participants and even their age, it is important that the questions for the online quiz are not very formal or based on formulas and other mathematical things, etc. The questions are more concerned with understanding statistical processes and general approaches.

3.1 GENERAL APPROACH

The general approach to determining the content of the school competition on statistics “Trend” is based on several principles.

First, our competition is fundamentally different from the exam. The exam tests students’ knowledge. The competition is held to encourage students to learn more about statistics. Of course, basic knowledge is necessary, but it is normal that a student opens a book on statistics for the first time during the preparation of a statistical survey as part of a competitive task. It is important that students develop an interest in statistics and an understanding of how this knowledge can be used in practice.

Second, “Trend” is pretty much a game. We have designed the tasks for the students in such a way that they can use the format “learning by doing – learning by playing”. Due to this approach, we have achieved some unexpected results. Students play statisticians. Children are different; some are interested in interviewing their peers, others can enjoy exploring Internet sites and searching for data. It is important that the game is not boring. On the other hand, it is important that students gain additional knowledge and work hard during the game because practical statistics are really the hard work. Therefore, an excursion to the regional office of ROSSTAT is an obligatory part of the competition. During the excursion, students can see how

adult statisticians “play” the same games that they do, using modern technologies, communication tools, and huge amounts of data.

Third, the goal of our competition is statistics, not sociology or computer design. If we ask students to conduct a survey and collect primary statistical data, it is important that they pay attention to the statistical part of the problem, that is, learn how to properly plan the survey, design the questionnaire, and ensure the confidentiality of personal data collected during the survey. Unfortunately, it is difficult to implement this approach in practice because much depends on school teachers, and they rarely are trained statisticians.

3.2 THE COMPETITION AT THE REGIONAL LEVEL

As it was mentioned above, there are two options for the participants at the regional level:

- Learning to collect statistical data;
- Learning to analyse statistical data.

In practice, most participants choose the first option and conduct surveys to collect primary data and make a presentation.

In the 2017/18 school year, the formal task in the category Learning to collect statistical data was “Conduct a research on the ‘Portrait of my peers’” (peers were meant to be from their school class, section, a club, from music, from art, sports school, etc.). There were traditional questions about pets, hobbies, sports, etc. In contrast, some presentations focused on specific issues such as tobacco smoking and Internet safety. It was interesting but the real problem was that in this first year it was a competition not concerning statistics but sociology. Children played sociologists who investigate really interesting questions without thinking about the accuracy of the information collected and processed. In this situation, the jury mainly evaluated statistical techniques such as questioning, presentations, and visualisation; yet, the originality of the ideas was incorporated in the evaluation. In 2018/19, the research topic was changed slightly to “What do my classmates want to become?” Despite the change of topic, the idea of this round remained the same: students should prepare and conduct a statistical survey to collect initial data, process it, and analyse the results. The basic problem here was to teach children how to use some classification of occupation to collect data comparable with published results because the comparability is the basic request for any good statistics.

There are several methodological points in any statistical survey, such as the definition of the object and the units of observation, the formation of a representative sample population, etc., which should all be done correctly. These things need to be explained to the teachers so that they can teach the students properly. The competition task also includes some simplifications in order not to make research too difficult for children (e.g., the survey period and the individual duration of the survey for all respondents was set at no longer than two weeks).

The participants in this category put together the questions with the required answers and formalised the answer form. The questions should be designed to ensure that respondents are as honest and willing as possible to answer them, taking into account the appropriate scope of the survey. After the survey, participants should generalise, group, analyse, and present the results in the form of graphs and tables together with an analytical summary of the research. The methodology of the survey analysis included examples of simple and combined grouping of data results, as can be seen in Table 1.

Table 1. Example of the proposed combined grouping of results

Gender	Age, in years		Total
	< 14	≥ 14	
Girls			
Boys			
Total			

In case the participants prepared a multidimensional survey and a combined grouping of results, the following organisation plan was proposed (see Table 2).

Table 2 Example of the organisational structure

<i>No.</i>	<i>Work stage</i>	<i>Duration</i>
1.	Terms of reference for the data collection.	from ... to ...
2.	Definition of the subject of the survey, the survey unit, and the time and duration of the survey.	from ... to ...
3.	Design of the questionnaire.	from ... to ...
4.	Conduct of the survey.	from ... to ...
5.	Checking the completeness and correctness of the answers.	from ... to ...
6.	Generalisation. Preparation of tables and graphs.	from ... to ...
7.	Analysis of the results. Preparation of the analytical summary.	from ... to ...
Total		30 days

In the academic year 2017/18, in the category *Learning to analyse statistical data*, the formal task was “To conduct a study of the welfare of the population using statistical sources”. In 2018/2019, the task was “Conduct an investigation of the structure and dynamics of the population in your region”.

The requirements included data collection using the following resources:

- Database of regional branches of the Federal Service of State Statistics.
- Database of the Federal Service for State Statistics (n.d.).
- Specialised databases of Official Statistics EMISS (EMИCC, n.d.).

The methodological instructions included the following steps:

- 1) To learn the basic concepts on the theory of statistics, the following were included:
 - Main indicators of population well-being, their design, and data sources;
 - Main rules for building tables and graphs;
 - Methods for calculating average values;
 - Methods for the measurement of variance;
 - Measurement of the variable dynamics.

- 2) Preparation of the research plan covering the following topics:
 - Type of information characterising the well-being of the population;
 - Indicators for the well-being of the population;
 - Period of research;
 - Method of analysis;
 - Form of the presentation of results.

The methodology for performing the task included instructions on the specificities of a time series analysis from the point of view of compatibility, such as differences between data at a point in time and during a time interval. The secondary objective of including this type of

category in the competition was to familiarise students with the use of official statistics and, in particular, statistical data sources (websites): their navigation, structure, and content.

As it was pointed out above, the first option at the regional level was more popular with school children than the second. Most teams chose to conduct surveys and collect and process original data rather than use official statistics. Teams of up to five children took part in the first category (teams up to this size are allowed by the conditions of the competition), while in the second category mainly individual pupils took part. From the point of view of ROSSTAT, however, the second category can be considered more useful as it introduces the use of official statistics. Both categories will therefore be maintained in the future.

3.3 THE COMPETITION AT THE FEDERAL LEVEL

As a rule, at competitions in statistics, students make tests on probability theory, characteristics of distributions, etc. Taking into account the vastly different backgrounds of the participants and their age, we can not to use this approach. Our questions are more concerned with understanding statistical processes and their application to everyday-life situations. Examples of questions asked in on-line quiz of different years are listed below:

Q1. Fermi question It is named after the American physicist Enrico Fermi as he was known for his ability to make good approximate calculations with little actual data. An example problem, of a type generally attributed to Fermi, is “How many piano tuners are there in Chicago?” So, our question is “How many domestic cats are there in Russia?”

Q2. Daniel Kahneman paradox Daniel Kahneman is an Israeli-American scientist who got the 2002 Nobel Prize in Economic Sciences. Kahneman is notable for his work on the psychology of judgement and decision-making. Kahneman is not a professional statistician, but he often uses a statistical approach in his work. In his book, “Thinking, Fast and Slow”, he presents the following example (Kahneman, 2011, p. 109):

A study of the incidence of kidney cancer in the 3,141 counties of the United States reveals a remarkable pattern. The counties in which the incidence of kidney cancer is lowest are mostly rural, sparsely populated, and located in traditionally Republican states in the Midwest, the South, and the West.

Paradoxically, the counties in which the incidence of kidney cancer is highest tend to also be mostly rural, sparsely populated, and located in traditionally Republican states in the Midwest, the South, and the West. Experts in sociology, political science, or medicine can come up with many hypotheses about how kidney cancer incidences are related to ecology, rural lifestyle, or the policies of the dominant party. But the explanation for why the sparsely populated regions with the highest and lowest mortality rates are neighbours with similar living conditions is not due to sociological or environmental reasons but to statistical reasons. Please try to explain this paradox.

Q3. Dice The great mathematician Leibniz considered the same probability of scoring both 11 and 12 points in two dice. But Galileo proved that the probabilities are different. Which of the great scientists was correct?

Q4. How many people came to the manifestation? If you need to roughly estimate the number of people who came to a large rally in the open space, how will you act? What if the number of people is constantly changing (someone comes, someone goes)?

Q5. Visualisation What is shown in the following diagram (Figure 1)? Does this graphic refer to you personally? Can you find the place where you belong to?

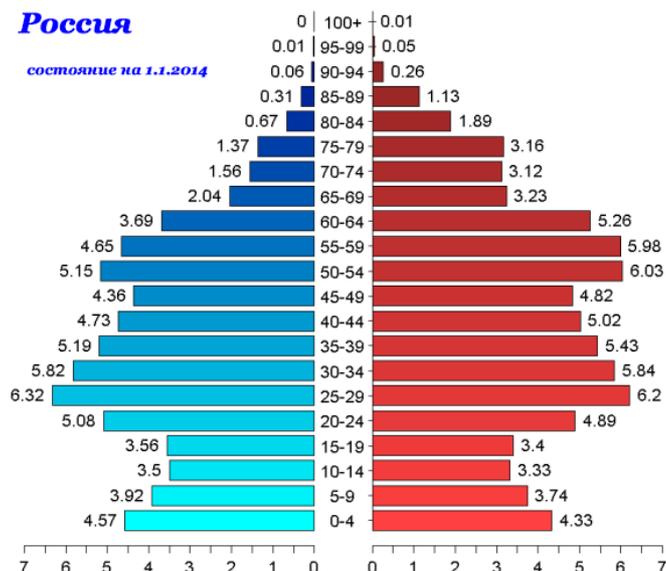


Figure 1. Illustration of Q5 from the on-line quiz
(the diagram has no proper label as this was part of the task for the participants)

Q6. The Best-Teacher Index If you are asked to survey all schools in your area and select the one with the best teachers, what statistics will you use for your analysis? Make a system of indicators and explain it.

4. OTHER IDEAS TO IMPROVE STATISTICAL LITERACY AND EDUCATION

Although the main content of this article concerns the organisation and content of the school competition on statistics named “Trend”, the authors cannot ignore the other related problem – helping university graduates who have just received a degree in statistics in finding their potential employers. On the other hand, employers are also interested in talented statisticians, and additionally they can advise universities on how to improve their programmes. These ideas constitute the content of this section.

4.1 “CAREER” – IDEA AND POSSIBLE APPROACH

University professors have their own ideas on how to teach students, and these ideas may differ from an employer’s point of view. Academic skills are very useful for basic research, but companies, banks, and official statistical offices want to employ staff with specific skills. Furthermore, students have the right to make choices according to their own career plans. To do this, however, they should be informed about their future employer preferences, which is rarely easy to achieve within academia. There is therefore a high demand for a communication format different from traditional academic conferences where students of statistical programmes can meet their potential employers to demonstrate their skills and competitiveness. This format would also provide an opportunity for employers to formulate their requirements and make some preliminary proposals to statisticians.

RASt calls this format a “kick-off” competition. For the first time, this programme will be organised in Russia until autumn 2020 under the name “Career”. The following procedure is going to be implemented.

1. RASt collects applications from interested employers, in which they have to formulate a research topic and requirements for the expected results. The research topics are not associated with a specific academic programme or university.
2. All bids are distributed among the statistical programmes of the participating universities. RASt has no specific relationship with any of the universities, so all students will have the same starting point.
3. After completion of the work, applications are collected by RASt and handed over to potential employers. Employers will review them to select the best ones.
4. The final phase of the kick-off competition “Career” is organised in the form of an interview with the winners of the first phase. Competitors will communicate with potential employers or conduct some tests.
5. The main prize for the winners of the second stage will be an internship in a company.

4.2 UNIVERSITY INTEREST

To be successful, every project should provide motivation for all those involved. The benefits for students and employers in the “kick-off” competition are obvious, while the motivation of the universities should be further clarified. Firstly, a strategic benefit for universities is the opportunity to increase their ratings through the successful careers of their graduates. Secondly, universities can improve their programmes according to the requirements of potential employers. Accordingly, RASt plans to collect and analyse all employer requirements in the future in order to make recommendations for the improvement of academic programmes and to distribute them to the dedicated universities.

5. CONCLUSION

RASt will continue to play a mediating role between all interested stakeholders in the educational process in statistics. The organisation of the school statistical competition “Trend” has proven to be a very useful and valuable event. The central aim of the competition is to familiarise pupils with the profession of statisticians and with the field of statistics in general. Although the competition contributed to statistical literacy in schools, some of the expected results were not achieved.

We will certainly improve the competition in order to organise pre-training for teachers, as well as to extend the list of participants to other regions of the Russian Federation. Even though the scope of the competition was not our primary goal, we still consider it very important to work towards expanding it in the future. It is particularly important to invite schools from the Far East and the northern regions of Russia, and also children from schools in villages and small towns, thus giving them equal opportunities and access to higher education in general and to studies in statistics in particular.

Another point to underline is our long-term goal to raise the status of the competition to the international level by inviting Russian-speaking children from other countries, especially from the CIS, to participate and, more importantly, to ensure that our winners are qualified enough to participate in the European Statistical Olympiad (ESO) (National Statistical Institute, n.d.). To this end, we will continue to make our tasks comparable to those of the ESO and build up the means to secure our future participation. Finally, we are very interested and willing to establish communication with the International Association of Statistical Education and UNESCO.

As far as the selection procedure for “Career” is concerned, the preparation for it is still in progress but can also be successful. After the first contact with potential employers, RASt has offers for student participants from several very solid Russian companies in the banking and oil industry as well as foreign companies in the consulting sector. Therefore, the general strategy of RASt seems to be reasonable in both cases.

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REFERENCES

- All-Russian School Competition in Statistics (n.d.). *Trend*. [Online: statkonkurs.ru/]
- EMISS – ЕМИСС (n.d.). *Official Statistics*. [Online: www.fedstat.ru/]
- Federal Service of State Statistics (n.d.). *Official website*. [Online: www.gks.ru/]
- Kahneman, D. (2011). *Thinking, fast and slow*. London: Penguin.
- National Statistical Institute (n.d.). *European statistics olympics for secondary school students 2018*. Republic of Bulgaria. [Online: www.nsi.bg/en/content/15556/european-statistics-olympics-secondary-school-students-2018]
- Ponomarenko, A. N. (2017). Reformatting statistical education in Russia: Changes in classifications, standards, and programs. In A. Molnar (Ed.), *Proceedings of the IASE 2017 Satellite Conference: Teaching Statistics in a Data Rich World*. The Hague: International Statistical Institute and IASE. [Online: iase-web.org/Conference_Proceedings.php?p=2017_Teaching_Statistics_in_a_Data_Rich_World]
- Ponomarenko, A. N., & Svirina, E. M. (2018). School Competition on Statistics: Cooperation between the Russian Association of Statisticians, ROSSTAT and Universities. In M. A. Sorto, A. White, & L. Guyot (Eds.), *Looking back, looking forward. Proceedings of the Tenth International Conference on Teaching Statistics*. Voorburg, The Netherlands: International Statistical Institute and IASE. [Online: iase-web.org/icots/10/proceedings/pdfs/ICOTS10_10B1.pdf?1531364366]
- Shatunova, O. V., & Sergeeva, A. B. (2014). Academic competitions and technology olympiads as a means to identify and develop endowments of school students. *Life Science Journal*, 11(11), 380–383.
- Vinuesa, M. J. (2017). Would you like to take part in a European Statistics Olympics!? *Conference of European Statisticians. Workshop on Statistical Data Dissemination and Communication 28-30 June 2017, Geneva, Switzerland*. Geneva: United Nations Economic Commission for Europe (UNECE). [Online: www.unece.org/index.php?id=44218]
- Yurkevich, V. S., & Davidovich B.M. (2009). *Russian strategy for talent development: comfort and discomfort. The Routledge International Companion to Gifted Education*. London and New York: Routledge, Taylor and Francis group, 101–105.

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