

CHARACTERISTICS OF USING STATISTICAL METHODS IN TEACHING GEOGRAPHY

Makhmudjon Jalolitdinovich Boltayev
Chirchik State Pedagogical University

Abstract: The article talks about the features of using statistical methods in teaching geography.

Key words: geography, teaching method, statistics, method.

In recent years, in our republic, great attention has been paid to comprehensive support of young people, introduction of digital education in the process of their education, fast delivery of information to students based on accurate and official sources based on modern teaching methods. In particular, in our country, "improving teaching methods, gradually applying the principles of individualization to the educational process, forming a healthy, strong and effective motivation to study in students" is considered as a priority task.

If we look at the history of the development of the society, in the development of geography education, the sciences of statistics and geography have constantly intersected. During the formation of the science of geography, it was initially called statistics, and it was considered as a part of the science of political science or country studies. In particular, the process of introduction of statistical concepts in Russian geography education is divided into four stages: Stage 1. Early period: 18th century - mid-19th century.

Stage 2. The emergence of statistical methods in the science of geography: the second half of the 19th century - the 30s of the 20th century;

Stage 3. Development of scientific methods: 30s of the 20th century - 80s of the 20th century.

Step 4. The most recent period: the 90s of the 20th century - the first years of the 21st century.

Stage 1. Geography was not taught as a separate subject until the middle of the 17th century. The basic information about geography was taught in the science of country studies, besides, the research goal of the science of geography and statistics was almost the same. However, the statistical indicators were not sufficiently analyzed from a geographical point of view, that is, they were given only as information. Geography was first taught in the educational institutions of Tsarist Russia in 1701 in the directions of mathematics and navigation.

The process of teaching geography from 1710 to 1876 is described in L. Vesin's work "Historical overview of general and Russian geography textbooks during the time of Peter the Great (1710-1876)". This work was reanalyzed by N.N. Baransky. Geography is taught in four courses, initially the elementary course of science: geography of the non-European parts of the world; European geography; It is called Geography of Russia. K. I. Arsenyev's pamphlet "Statistics of the Russian State" was used in the course of geography and statistics. In the 30s of the 19th century, the science of statistics was included in the gymnasium curriculum. In this period, geography was not taught as a special course, but the main figures and information related to the subject were memorized by students.

Stage 2. The emergence of statistical methods for teaching geography: the second half of the 19th century - the 30s of the 20th century.



From the second half of the 19th century, the scientific aspects of geography began to develop rapidly. The establishment of the Geographical Society led to the development of great scientists in the field, and the launching of scientific and practical expeditions. In this period, geography education was distinguished from the previous period by its quality, including the scientific analysis of statistical data. Information about numbers has been increased in the training manuals. However, numbers related to science are still memorized, and its analysis and systematization were not well established.

For the first time in the history of geography teaching methodology, the Russian scientist D.D. Semyonov tried to systematize the methods of teaching this subject. After the publication of his work "Pedagogical instructions for teachers", a number of literature on geography methodology began to be published. In these works, guidelines for the use of statistical methods as well as several methods in the process of teaching science are described. D.D. Semyonov proposed teaching students in a certain order to memorize statistical numbers [1].

By the end of the 19th century, the theoretical aspects of teaching geography were somewhat outdated, and experts in the field felt the need to update it. It was noted that by scientifically strengthening the subject, it is possible to conduct classes in accordance with the times.

At the beginning of the 20th century, Y. I. Rudnev, another Methodist scientist, noted that graphs are very useful in teaching geography. One of the main places among visual aids is occupied by graphic images. They can describe the size of regions and regions, their borders, the area of countries, population and density, economic growth of regions, etc. According to Y. I. Rudnev, information given in numbers can be misleading, so it is better to act according to the opinion of experts. Some graphs showing the structure of a process (territorial structure of the population, structure of agricultural productivity, etc.) should be presented in a circle view.

V.P. Budanov supported the opinion of Y.I. Rudnev and emphasized that "in the teaching of geography, it is necessary to use numbers in the right place." The numbers are presented here to give you a clear idea of the value. As mentioned above, numbers are useful when comparing two or more events [53]. For example, the largest city in Uzbekistan is Tashkent, and in order to determine its other characteristics, it is necessary to compare it with a city close to it. An example of such a city is Baku, the capital of Azerbaijan. In order for the task to be more understandable, students themselves can work directly with the graph. If they describe the graphs themselves, it will be easy for them to remember the same events and numbers presented in different processes.

developed: "Study and charting the state of education in Denmark: its literacy rate compared to other countries (in percent), number of schools per 1,000 people, number of newspapers, magazines, books published, etc."

In teaching geography to students, the graphic method was intensively used as follows (Dalton plan). The students were given the following task: "Compare and graph the production of coal (rock salt, gas, oil, iron ore) by major countries before and after the First World War. Draw a curve of coal (oil, rock salt, iron ore) production over recent years by country.

S.P. Arzhanov, one of the Methodist scientists, also focused on statistical data. According to him, it is necessary to collect quantitative data through observation and experimentation. That is: "The materials necessary for the calculation should be obtained from the surrounding objects" [36]. In addition, by processing the data of the selected object, it will be possible to find its average value.



S.P. Arzhanov did a number of things to popularize the graphic method. In his opinion, "any performed work must be described in the form of a diagram. It depends on the teacher's skill to get the students to graphically represent the information they have collected. Regular and repeated graphic exercises will greatly help to master the training. As a result of these exercises, students can animate numbers" [36]. According to S.P. Arzhanov, graphics organize information, increase students' interest in this matter, teach them to do the exercise independently, and also help to remember factual material.

S.P. Arzhanov suggests the following procedure for working with graphs depending on the level of knowledge of students:

1. It is better to give students with basic knowledge both graphs and the method of graphs (lines, squares) in a relatively simple form.
2. Students with a good level of knowledge can be assigned to work with more complex graphs and diagrams. Graphs are represented by curves, and its meaning is a comparison of two processes. The result clearly shows the relationship between them, and the curve shows the law being studied. According to the scientist, students who have sufficient understanding in this regard can do the calculations themselves. For example, the importance of natural resources necessary for the formation of agriculture: soil (fertility), water (mineralization composition), light (energy) and heat (sum of positive temperatures) resources is studied. In addition, the availability of labor resources of the region is taken into account [2].

L. D. Sinitsky: "Statistical data on economic and social geography, especially on industry, agriculture, demographics, population structure, consumption, trade, and transport are very important" [75]. However, there are specific guidelines for working with numbers, which he offers:

- summing up the received information.
- to be able to use absolute and relative numbers.
- if there is a lot of information, extracting the necessary by comparing them.
- to study their gradual change in the proportion of different times (month, year).
- graphical representation of the results. Because diagrams, cartograms and cartograms give a clear picture of the studied phenomenon [75].

In the 1930s and 1940s, A.C. Barkov expressed the issue of using numbers in geography lessons as follows: "We can clearly say that the problem of numbers has not been solved in the methodology of our science. Students must master certain quantitative indicators. Geography, especially in higher education institutions, should be taught to adequately understand digital data, to show a process or event in relation to situations. Here, the task before the science of geography is not so complicated, only when using numbers in training, it is better to reduce their amount as much as possible. It is desirable to present the given numbers through graphs or diagrams.

Researches have a scientific-methodological character in the teaching of comprehensive geography. Therefore, the attention of these scientists is focused on the study of statistical indicators, their content, consistent use in individual courses and topics. It is known that statistics is a field of knowledge that defines the general issues of mass statistical (quantitative or qualitative) data collection, calculation and analysis, in other words, it is the study of quantitative indicators of mass social phenomena in the form of numbers.

N.N. Baransky has done very important work on the methodology of applying statistical methods in the geography of higher education. He reveals the importance of digital material in



the study of geography by showing methods of working with statistical indicators, as well as tables and graphs in the work "Economic Geography Teaching Methodology". He noted that many teachers do not know enough how to work with digital materials and how to use them. About the interaction of statistics and geography, N.N. Baransky noted the following: "The statistical method has several advantages over other methods, but it also has its own side, which is very necessary for geography. Numbers are important to a statistician, but that's not all there is to it. Therefore, students should have basic information about this during school. Since statistical concepts are not included in the secondary school curriculum, the responsibility to provide these skills falls on the subjects available in higher education. Among these sciences, without a doubt, this task falls primarily on economic geography."

N.N. Baransky suggests the following methods of working with numbers:

1. Putting numbers in a certain pattern. Numbers cannot be used blindly in this field of science. Because it is difficult to remember all the numbers. Therefore, they can be arranged in ascending or descending order.
2. When they are in a mold, it is determined that they will be needed for research.
3. Using graphs in the process of working on rounding numbers and in the process of working on displaying spatial images.
4. Application of statistical and economic indicators. In order to consciously work on digital material, it is necessary to understand the meaning of each of these indicators, how and where it comes from, how it is related to other indicators, and what it gives for the economic and geographical characteristics of the country. Working with indicators can be different - writing in tables, displaying graphics, comparing, combining, changing [3].

In the process of working on digital materials, N.N. Baransky suggests the following types as the main ones:

- I. Work with individual information found in the text. Clarifying indicators using the comparison method. After that, keep the data entered into a system in the form of a table;
2. Work with tables based on elementary rules:
 - a) read the title of the table, b) read the title of rows and columns, c) read the table according to the row or column within the task, c) remember the numbers in the table during reading, g) repeat what they read;
3. Since graphs are the mainstay of higher education geography, numerical data is plotted on a graph. The best of these graphic images are cartograms and cartograms.

In general, N.N. Baransky suggests working with digital data in the following stages:

1. Rounding off numerical data.
2. Clarification of quantitative indicators.
3. To reveal the most important statistical and economic indicators and their importance in connection with these indicators.
4. Application of statistical and economic indicators. To consciously work on digital material, it is necessary to understand the meaning of each of these indications, how and where it comes from, how it is related to other indications, and what the country's economic and geographical features give it. Working with displays can be different - writing in tables, displaying graphics, comparing, combining, changing [34].

In the process of working on digital materials, N.N. Baransky suggests the following types as the main ones:



I. Work with individual information found in the text. Clarifying indications using the comparison method. After that, keep the data entered into a system in the form of a table;

2. Work with tables based on elementary rules:

a) read the title of the table, b) read the title of rows and columns, c) read the table according to the row or column within the task, c) remember the numbers in the table during reading, g) repeat what they read;

3. Since graphs are the mainstay of higher education geography, numerical data is plotted on a graph. The best of these graphic images are cartograms and cartograms.

In general, N.N. Baransky suggests working with digital data in the following ways:

1. Rounding off numerical data.

2. Clarification of quantitative indications.

3. In connection with these indications, the most important statistical and economic indications and increase their importance.

4. Making and reading tables.

5. Graphic interpretation of digital data.

The process of using quantitative data is mentioned in the works of a number of scientists. For example, when studying the topic "World economy", the following information is very necessary: annual average of production, average of countries, maximum and minimum quantity, annual and quarterly production results are considered.

In this regard, V. G. Erdeli believes that digital data should be presented to students in the following form: 1) rounded; 2) compared; 3) visual (graphic).

The importance of the method of comparing numbers in repeating the previous exercise was emphasized by A.B. Sergievsky noted. According to him, the regular repetition of the lessons will help to strengthen the consciousness of students. This research was carried out in a number of countries and compared them to each other. In the same way, the researchers compared the territorial characteristics of the production, population changes, density and national structure, and in the end, they freely placed all the studied data.

Currently, geography teachers should widely use statistical data not only as an illustration of geographical objects, events and phenomena, but also as a means of searching for new knowledge, for this, pedagogues should thoroughly master the methods of statistical data processing.

Summarizing the study of methodological literature close to the research topic, it is necessary to teach statistical methods to students in order to form a scientific outlook, comprehensively develop knowledge and creative abilities, and be ready to learn.

Despite the variety of tools offered as a result of pedagogical research on the development of students' skills in working with statistical data, in our opinion, in the development of students' skills in working with statistical data, modern pedagogical technologies and the issue and exercises should be used effectively.

References:

1. Беспалько В.П. "Слагаемые педагогической технологии". Москва: "Педагогика"-1989. – С. 6-11.
2. M.Q.Raxmanova "Scientifik and pedagogical bases of preparation of students for development of social activity in the procrss of professional and pedagogical education" B.283-28.



3. Raxmanova, M. (2023). PROBLEMS OF DEVELOPING SOCIAL COMPETENCE OF STUDENTS IN THE PROCESS OF HIGHER PEDAGOGICAL EDUCATION. *Science and innovation*, 2(B5), 258-263.
4. Khahramonovna, R. M. (2022). Problems of Improving Social Competence of Students in the Process of Higher Pedagogical Education. *Central Asian Journal of Literature, Philosophy and Culture*, 3(12), 48-52.