Research Article

Statistical Programs In The Teaching Of Physical Education Classes

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Abstract. The scientific work is devoted to the analysis and application of applied statistical programs in teaching the discipline "Sports metrology". The state conducts a comparative analysis of statistical software packages and their capabilities, shows the role of sports metrology and methods of mathematical statistics, as well as mathematical analysis, which are a powerful help in the scientific approach to the development of sports, where physical education and sports training of female students are a kind of production process, a product which is the physical, technical, tactical, psychological and theoretical readiness of the trainees (and in general for the athletes - their sports readiness). The use of the methods of mathematical statistics makes it possible to conduct an objective analysis of the results of pedagogical, medical, psychological examinations and obtain substantiated recommendations for improving sports training. A comparison of various statistical programs is given, where it should be borne in mind that almost all of them have a set of standard procedures.

Keywords: sports metrology, innovative technologies, packages of applied statistical programs, STATISTICA, Statgraphics, MicrosoftExcel.

Since Uzbekistan gained independence, in order to maintain and grow the socio-economic potential of the country, great attention has been paid to creating all the necessary conditions for the population, especially the young generation, for regular physical culture and mass sports. Large-scale work has been carried out to strengthen youth, through sports competitions, will, faith in their own strengths and capabilities, develop their courage, a sense of patriotism and devotion to the Motherland, systemic organization of measures for the selection and targeted training of talented athletes from among young people.

In recent years, training of highly qualified athletes has been an urgent problem all over the world, and this is impossible without a scientific study of the development trends of children and youth sports, which depends on the development of scientific, methodological and technical support.

At the same time, a number of problems remain that hinder the improvement of the quality of education in higher educational institutions, in particular, the process of organizing training [1, 2].

The implementation of state programs in the field of education and sports is impossible without a scientifically grounded search for effective ways to improve its system, which aims at modernizing the educational process, using innovative advanced technologies, interactive means and methods in the learning process, which makes it possible to improve the quality of education and raise the level of mental and physical development of the younger generation [3].

The use of statistical procedures makes it possible to objectify conclusions, better build the training process, and increase the selection efficiency.

The relevance of this work is to consider the application of information technologies, in particular a number of statistical programs, along with the most modern educational technologies, in teaching such disciplines as sports metrology, the basics of mathematical statistics and mathematical analysis in sports and its management. These funds serve as a significant help in improving the professional level of training of specialists in the field of sports.

It should also be said that in similar universities abroad, statistical data processing is carried out, as a rule, with the help of appropriate software products, and the use of applied software packages in carrying out statistical analysis is closely included in the educational process. An indispensable condition for the successful development of the discipline "Sports Metrology" is computer skills and the ability to work in applied statistical programs.

The main task posed by the researchers is to study various packages of statistical programs, their comparative analysis and the possibility of using them in teaching girls students of physical culture.

Thus, the need to automate and simplify the process of statistical processing contributed to the development of the market of computer programs for statistical processing of data. The programs are constantly being improved

in terms of speeding up work with data, improving the presentation of data analysis results, increasing the convenience of the interface, improving the help system, increasing the number of built-in statistical procedures, data processing tools and etc. Due to the range of tasks covered, they can be useful not only for students at the stage of studying statistical methods, but also for scientists, economists, solving problems of analysis and forecasting using statistical data. But the question arises before the experts: which of the programs to choose from the many available?

In connection with the above, we will analyze the advantages and disadvantages of statistical software packages. Professional packages have a large number of analysis methods, popular packages have a number of functions sufficient for universal use. Specialized packages are focused on some narrow area of data analysis.

Let's consider the features of some statistical software packages.

One of the oldest and most frequently used statistical data processing systems - SAS - began its journey on mainframes and still has the widest coverage of various computer platforms. SAS has a software-modular structure, which means that there are specialized data processing modules (statistics - STAT, decision support - OR, graphics, etc.), and inside the module there are programs that perform this processing. Moreover, the main way of communicating with the system is the command line. The strengths of SAS are its data processing capabilities, the completeness of the procedures presented, and its extensibility. The charts offered by the system are quite impressive, however they cannot be compared with those generated by S-Plus or Statistica. The system includes a command language, matrix language (IML) and macro support.

SPSS is, along with SAS, one of the oldest statistical data analysis systems. The first version of the SPSS package was released in 1968. The package is based on a basic module that allows you to manage data and contains the most common methods of statistical data analysis. SPSS now includes a large number of statistical procedures, data manipulation and graphing capabilities. The elaboration of statistical algorithms is extremely thorough and allows for good control over the data processing process. Most of the options are available from menus and dialog boxes, which sets SPSS apart from SAS shells. The advantages of SPSS are considered to be such factors as: a developed apparatus of statistical analysis; versatility; a wide range of statistical and graphical data analysis procedures, as well as procedures for creating reports; high speed of calculations, simple and convenient interface, etc.

The first version of the STATA package was released in 1985. The package is positioned as an analysis tool designed for professionals who are engaged in scientific research. According to the developers, due to the flexible modular structure, the package is applicable for data analysis from various fields of knowledge. Stata is a highly developed statistical data processing system that exists on all major operating systems - MS DOS, Windows 3.1, Windows 95, and UNIX. In essence, this program is nothing more than an interpreter of the statistical programming language. All the positive and negative aspects of the system stem from this. Expandability, the presence of a large number of programs written by users of the system (the company's technical support service publishes a magazine containing programs written both by employees of the corporation and by users), full compatibility of procedures created on different platforms and the ease of programming its own statistical programs. It is clear that all these advantages are necessary, first of all, for professionals in the field of statistical data processing, but they are unlikely to make a great impression on the beginners. The disadvantage of the package is the lack of a Russian version and the requirement for the user to know the basics of programming (to maximize the capabilities of the package).

The first version of the STATISTICA package was released in 1991. The package has a modular structure, that is, it consists of modules, each of which is used to solve its specific class of problems, namely: time series analysis and forecasting, multiple regression, nonlinear estimation, factor analysis, structural equation modeling, nonparametric statistics, analysis of variance (ANOVA / MANOVA), discriminant functional analysis. Several modules are combined into the industrial statistics group: quality control, process analysis, experiment planning, in addition, among the package tools, one can name neural networks and a block of procedures dedicated to industrial statistics (including quality statistics). The convenience of entering data in the STATISTICA program is due to the fact that the table file is similar to that of the Excel program. This program allows you to import data from other Windows applications and DOS programs, such as: MS Excel, MS Access, FoxPro, Paradox, dBASE, CSV, SPSS, as well as from * .txt files. It is very convenient for a novice user, but it drastically slows down the activity of an experienced one and does not allow effectively repeating the same procedure several times. Statistica is a relatively small program, occupying about 24 MB and has one of the best help systems. The disadvantages of the package are: lack of implementation of some important time series tests; poorly developed block of methods aimed at econometric modeling; low expandability; lack of third-party modules and users, as well as insufficiently effective command language.

Statgraphics was developed for personal computers running MS DOS. In those days, it opened a menu system for users who were tired of the SAS and SPSS command line, clear high-resolution graphics, great opportunities for exporting graphic images in combination with a fairly complete set of statistical algorithms. However, on computers equipped with the Windows operating system, Statgraphics ceded its position as the "statistical system No. 1 for beginners" to the Statistica package (suffice it to mention the fact that 5 versions of

Statgraphics have been released for DOS, while only the third version is released for Windows. version). However, Statgraphics still maintains its commitment to targeting novice users, coupled with powerful data visualization capabilities. It should be noted that the structure of Statgraphics is quite different from that of Statistica or SPSS. The fact is that the procedures in this program are grouped by the types of analysis, and not by the features of the algorithms. So, the menu items have the following names - “Compare”, “Analyze relationships”, “Describe” - which greatly facilitates the selection of the necessary procedures, for example, in comparison with such a menu item as “Basic statistics”. It should also be pointed out that one of the greatest strengths of Statgraphics is its data visualization capabilities.

Despite the variety of statistical software, the most commonly used software package (application) Microsoft Excel [4], although it is not a statistical program, but an office application. This is due to the widespread distribution of the Russian-language version of this software application for personal computers. MS Excel provides opportunities for economic and statistical calculations, graphical tools and macro programming language VBA (VisualBasic for Applications). Microsoft Excel includes a set of data analysis tools (the so-called analysis package) designed to solve complex statistical and engineering problems.

Therefore, in the first place are the differences in the user interface, the completeness of the coverage of modern statistical methods, programmability, the presence of additional extension modules and the ease of using the resulting graphs and tables in other programs. Although not all of the above requirements can be met at the same time. In this respect, STATA and SAS are at one extreme - managed primarily from the command line, but with a large number of easily plug-in and use additional modules. On the other - Statgraphics + and Statistica, which have an extremely attractive interface, complete and convenient for beginners, but with almost complete absence of additional (free) modules and subroutines.

Thus, due to the modern level of development of information technologies, researchers in various fields of science and technology, economics and production, as well as educational institutions, have available scientific and statistical software packages that satisfy the various needs of users.

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