Methodical Aspects Of Realization Of Using MATLAB Program İn Teaching Of Algebra İn Higher Pedagogical Schools

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Abstract

The use of computer technology in education impact to students positively on the formation of computer usage culture, the event will be organized by the Ministry of culture and tourism serious mastering, strengthening of acquired knowledge and skills gives boost. Therefore, recently in the teaching of mathematical and other courses use of technology of computer is actual. In this case, the teaching of the algebra course in the higher pedagogical schools opportunities of using the MATLAB program and implementation methodology is presented. Mathematics of higher pedagogical schools Elementary Mathematics, Mathematical Analysis, probability theory and mathematical statistics, theory of differential equations, etc. to use the program with the method MATLAB in teaching science is expedient shown in the work which it is done.

Key words: algebra, vector, matrix, methodology, MATLAB.

Introduction

One of the problems coming across the teaching methodology of mathematics and algebra is the answer of the question is How to teach?". It is natural to investigate various methodical, psychological, pedagogical issues in order to overcome the difficulties encountered depending on the content and purpose of teaching the subject. Among these issues, it is essential to investigate the application of the tools used in modern times, especially computer technology[2, 3, 4].

In computer technology, the MATLAB software package is commonly used in modern times. Hence, this program is an indispensable tool for solving scientific and technical issues that cannot be solved by analytic ways, which do not have an exact solution, require more computational work. Recently, the subject " Engineering mathematics " is taught in higher technical schools [6].

In the presented work, classes on the issues solved by using MATLAB software package and ways of teaching their solution are studied in the teaching of algebra, which is one of the most important chapters of mathematical education given in mathematics specialties of higher pedagogical schools.

Literature review

In a number of mathematics subjects of higher pedagogical schools, including in algebra courses, analytic methods of solving difficult or impossible problems, as well as only approximate solutions numerical and approximate methods of solving are studied in the upper courses of relevant specialties in the subjects of "Computational Mathematics", "Computational methods". Along this, the subject "programming in EHM", which is intended to teach students programming languages that realize the mentioned types of issues, as well as scientific and technical calculations on the computer, is taught in the upper courses. The development of programming languages has led to the creation of their next generation classes. MATLAB and various fuzzy TECH, MATCAB, MOTEMOTIKA, etc. application software packages have occurred. Already a number mathematics courses of higher pedagogical schools, to solve the relevant problems of it is necessary to use MATLAB and other method-oriented software packages as in higher technical schools.

It is advisable to use the MATLAB software package for this purpose in the algebra course. To realise this, 2-3 laboratory sessions are organized outside the auditorium to teach students the Basic Rules of working in the MATLAB program system and the main characteristics of this system. After that, students are instructed to solve simple issues related to the subject in the relevant lectures and practical sessions of the algebra course by using this program.

Methods
The research methods cosist of this:
- General theoretical (analysis of scientific and methodical literature, terminology system);
- Empirical (pedagogical observation, survey, testing);
- Analysis of normative documents – subjects of the algebra course in state standards, curricula and programs;
– Analysis of psychological-pedagogical, mathematical, methodical literature and textbooks for studying the initial sources of the research topic.

Findings and Conclusion
In the first laboratory exercises to use the MATLAB software package, it is planned to implement the mastering of the Basic Rules of operation in MATLAB:
Explained are the main windows of the MATLAB system and interpreted and executetheir are main functions [6,pp. 10-10].11];
interpreted and executed forms of presentation of real numbers and determination of accuracy of calculation [6, pp. 5-6].15];
Carried out the presentation and execution of some elementary and commonly used mathematical functions [4,pp. 3-4].19];
For example, enter the command.

$\gg\sin(0.5)$

Pressed the Enter key. The result is obtained:
 ans =
                0.4794
After the students have acquired the necessary knowledge and skills to work in the MATLAB system, they independently carry out the tasks given in the corresponding exercises of the algebra course in the laboratory.

Here are some of the topics of linear algebra, mainly related to the concepts of "vector" and "matrix", the tasks solved with the help of the MATLAB package and the rules of their modeling are interpreted. The theme of "Vector spaces of Account" [1,pp. 3-4].111] when teaching the inclusion of vectors and the execution of actions on them is carried out in the laboratory exercise.

In MATLAB the vector is a matrix consisting of a row or a column. They are called respectively Line-vector or column-vector, . Several methods are used to enter vector. Can be entered list the element of the vector. For example,
$\gg$A=[4 7 20 30]
The command is executed by pressing Enter:
A=
4 7 20 30
If in the program of the vector the elements are separated from each other by a semicolon, that time makes the column-vector .
If the elements of the vector create a numerical series,then the initial price of this vector can be given by specifying the step and the final price.
$\gg$P=1; 2; 7
P=
3 5 7
The vector can be given by combining several vectors. For example,$\gg$ A = [4 5 6]; B = [17 18 19]; C = [10 15 20]; D = [A B C]
D = 4 5 6 17 18 19 10 15 20
On the vector, subtraction, multiplication, multiplication of the vector on the number are modeled as so.
$\gg$A=1: 2: 3
A = 1 2 3
AA'
The result is a column consisting of those elements and vector.
multiply and subtraction of two vectors
$\gg$A+B and $\gg$A-B
in the form of; multiply
$\gg$A*B
that; multiplication of the vector by the number
Modeled like a A*n.
The Matrix. Acts on matrices [1, PG.164] after studying the subject, the execution of the following

commands is modeled and carried out in the laboratory exercise related to it.

Inclusion of a matrix. For example,

≫M=[3 6 1; 5 8 2; 6 8 9]

M =

■(3&6&1@5&8&2@6&8&9)

The sequence of the matrix – A.

The sum of the matrices -A+B.

The difference of matrices -A-B.

Product of matrices -A*B.

The product of a matrix – A*n.

It should be noted that when performing the operations indicated on the matrices, it is necessary to take into account the conditions under which the components are subject to their availability.

The MATLAB program has standard functions for entering a number of special type matrices. Of these, the following can be cited [3,4].

Single Matrix-eye (n);

Zero Matrix-zeros (n);

Matrix consisting of units – ones (n)

Diagonal matrix-diag (A);

In order to obtain a diagonal matrix, it is necessary to enter the number of elements into the vector, which determines the order of the Matrix and the elements into the head diagonal elements of the wanted Matrix.

Adam matrix-hadamar (n);

For such a matrix, the sum of the product of the corresponding elements of the arbitrary two columns is equal to zero.

Hilbert matrix-hilb (n);

In such matrices, the i-line and the element in column is j

$h\_ij=1/(i+c-1),i,c=\{1,2,...,n\}$

it is determined by equality.

Conrast hilbert matrix-invhilb (n).

In the specified standard functions, the letter A(n)means the ordinal is A matrix. The MATLAB program has special functions for determining the main indices of the square matrix [3,4]. It is expedient to provide information on these features in the teaching of relevant topics [3,4].

Determinant of a matrix – det (A);

Inverse of a matrix – inv (A);

Color of a matrix – color (A);

Trace of a matrix-trase (A);

Special values of Matrix a – eig (A);

It should be noted that the MATLAB software package also includes standard functions related to the concepts "vector" and "Matrix", but which carry out simple calculations that do not pay attention to their study in the algebra course [4, pp. 3-4].35]. Of these, the results of the implementation of a number of standard functions that provide for the processing of elements of the matrix can be noted: sum of rows, columns and all elements); maximum (minimal) elements on rows (columns); average numerical values on rows (columns).; sorting of rows (columns) elements by increment, etc.

Thus, the simple questions that were easily solved in MATLAB, which were related to vectors and matrices taught in linear algebra, were considered. Their study is more complex, solving linear equations and nonlinear equations, grammar rule and Hauss method solutions of linear equations system, etc. it provides the basis for the solution of some issues.

It should be noted that the MATLAB programming language is widely used in mathematical studies [5,7]. Providing initial important information reflecting MATLAB's Alphabet is important in engaging students in modern mathematical research.

As a result of observations it was found that the use of MATLAB software package in teaching a number of issues of algebra course increases students ' interest in science and positively affects the formation of abstract thinking in students.

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