USE OF PROGRAMMING ENVIRONMENT IN TEACHING INFORMATION TECHNOLOGIES AND INFORMATICS SECONDARY EDUCATIONAL SCHOOLS

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ABSTRACT--*The use of teaching methods in teaching programming languages in secondary schools enhances student engagement, motivates independent research and improves educational performance.*

Key words--*software, learning methods, programming environment, delphi, jigsaws galore, case, component, application, database.*

I. INTRODUCTION

Currently, information is covered in all areas of human activities, and this event requires a high level of information culture. Therefore, the school's curriculum needs to be completed the disciplines that enable students to develop their knowledge, skills and abilities. The purpose of education today is to teach students to act independently in the ever-expanding information learning environment, to use modern information technologies in a variety of fields, and to use information flow usefully. To that end, creating opportunities for students to work independently and to teach creative thinking and independent decision-making will improve the quality of education. The solution to this problem is, of course, the quality of training that is the main organizer of this process. Each teacher is required to acquire the following 3 qualifications:

• Depth knowledge of the teacher's the subject he or she teaches;

• Pedagogical teaching skills of a teacher, that is, conveying the subject to students;

• The teacher should enter in a classroom, forgetting about the psychological state, such as his / her life and family problems.

The future of each society is determined by the level of development of the education system, which is an integral part of it. Today, it is necessary to reform and improve the system of continuous education, to bring it to a qualitatively new level, the introduction of advanced pedagogical and information technologies, the effective use of innovative technologies to ensure the results of higher learning. One of the most pressing problems is the use of pedagogical innovations in the development of modern methods of information technologies. Applying innovation to the educational process today requires the following tasks:

• Defining the specific purpose of the subject;

• Determining the size and content of the subject;

• Development and recommendation of necessary educational technologies;

• Creation of material and technical support of science;

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• Studying characteristics of the trainees;

• Design of teacher training and classroom activities.

The best way to solve the above tasks is to develop integrated learning technologies in the design of lessons, and to look for opportunities to use them effectively at different stages of the lesson. In teaching computer science, it is advisable to use the following teaching methods:

• game technologies;

• problem-based learning;

• programmed learning;

• computer training;

• modular training.

II.   ANALYSIS

These methods help to gain learners organizing and activating skills, to find their place in life, as well as self-government, pursuing their own capabilities, nurturing a will, specific approaches, spiritual, aesthetic skills, and to nurture collaboration, teamwork, and communication in shaping the world outlook. The use of programming languages in teaching computer science and information technology teaches students to think logically, to develop algorithms and programs, to implement them with computers, to use software developed in various areas of society, and to analyze results. In teaching, it is usually beneficial to take them into account, depending on their abilities and what programming languages they are interested in. In addition, using games, exercise programs, visual and multimedia tools can make it easier for the reader to remember and visualize the process.

Currently, several programming languages are developed, such as Pascal, Delphi, C ++, C #, Python, Java and others. These programming languages are intended to solve a particular problem and they can be called object-oriented programming languages. Common language of programming is Pascal that is designed to teach programming languages. The main reason for the extensive use of Pascal programming language is the simplicity and ease of use of the program. More than that

```
    private
    procedure sphere();
        { Private declarations }
    public
        { Public declarations }
      end;
    var
      Form1: TForm1;
      PosX, PosY, VelX, VelY: integer;
    implementation
    {$R *.dfm}
    procedure
    TForm1.FormCreate(Sender: TObject);
    begin
```

```
PosX:=1;

PosY:=1;

VelX:=2;

VelY:=3;

end;

 procedure TForm1.sphere;

 begin

 PosX:=PosX+VelX;

 PosY:=PosY+VelY;

 if PosX>ClientWidth-Shape1.Width then   VelX:=-VelX;

 if PosX<0 then   VelX:=-VelX;

  if PosY>ClientHeight-Shape1.Width then   VelY:=-VelY;

 if PosY<0 then   VelY:=-VelY;

 Shape1.Left:=PosX;

 Shape1.Top:=PosY;

 end;
```

We chose Timer component from Events feature OnTimer condition and we enter the following code:

```
var

s:Trect;

begin

shar;

if IntersectRect(s,Shape1.BoundsRect, Shape2.BoundsRect)  then

begin

VelX:=-VelX-random(5);

VelY:=-VelY-random(5);

end;
```
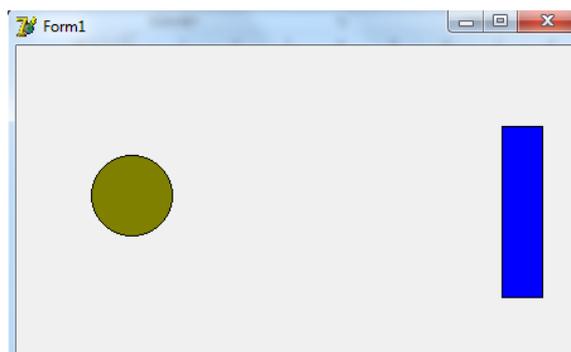

Figure 1: You can see the result by selecting the F9 key.

(Tennis game view)

Delphi is a very convenient for graphical representation of functions. Delphi has custom controls to work with graphics. We will look at these components by generating the function graph$y = \frac{1}{a*x^2+b*x+c}$ in the app. The

function given by the Load command can be placed in the form of an image. Enter Button1's Events property into the OnClick event and enter the following

```
procedure TForm1.Button1Click(Sender: TObject);
const
mash=100;
var
a,b,x0,y0:integer;
x,y:real;
begin
image2.Canvas.Pen.Color:=clWhite;
image2.Canvas.Rectangle(0,0,ClientWidth,ClientHeight);
a:=StrToInt(Edit1.Text);
b:=StrToInt(Edit2.Text);
x0:=Image2.Width div 2;
y0:=Image2.Height div 2;
with image2.Canvas do
begin
Pen.Color:=clGreen;
Pen.Width:=2;
MoveTo(x0,0);
LineTo(x0,ClientHeight);
MoveTo(0,y0);
LineTo(ClientWidth,y0);
end;
x:=-10;
repeat
x:=x+0.1;
 //y:=-x*x;
y:=-1/(a*sqr(x)+a*x+b);
image2.Canvas.LineTo(trunc(x*mash)+x0,trunc(y*mash)+y0);
until x>=10;
end.
```
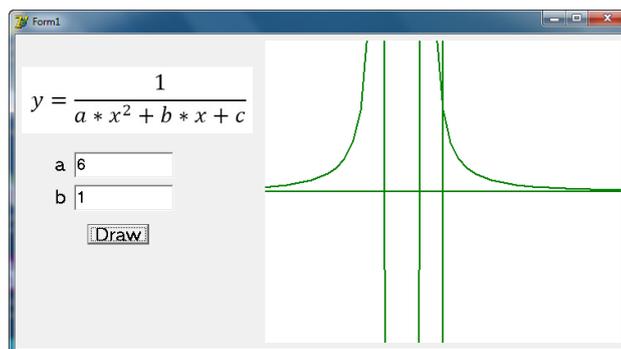

Figure 2: Radio Group (radio button group)

Radio Group (radio button group) - Selects one of several options. This component has several features, including Items, Caption, Font, Width, Height, etc. Let's look at a program that generates a "font adjustment window" using the Radio Group component and Edit components, the ChecklistBox component from the Additional folder.
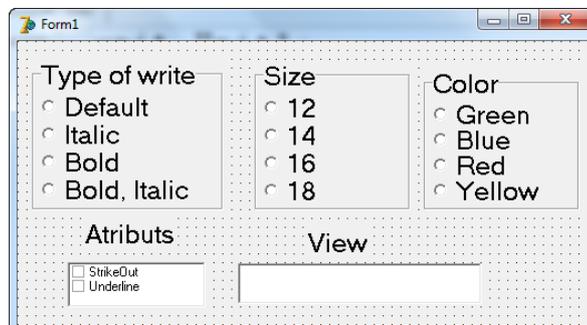
Figure 3: The values of the Checklist Box

The values of the Checklist Box component's Items feature and the Radio Group components through the Caption and Items properties are shown in the image above. From the Events property of the RadioGroup1 component, access the OnClick event and enter the following codes:

```
procedure TForm1.RadioGroup1Click(Sender: TObject);
begin
case RadioGroup1.ItemIndex of
0: edit1.Font.Style:=[];
1: edit1.Font.Style:=[FsItalic];
2: edit1.Font.Style:=[FsBold];
3: edit1.Font.Style:=[FsItalic,FsBold];
end;
end;
```

We enter the folowing code in Radio Group2 components from Events features OnClick.

```
procedure TForm1.RadioGroup2Click(Sender: TObject);
begin
case RadioGroup2.ItemIndex of
0: edit1.Font.Size:=8;
1: edit1.Font.Size:=10;
2: edit1.Font.Size:=12;
3: edit1.Font.Size:=14;
end;
end;
```

We enter the following code inRadio Group3 components from Events features OnClick.

```
procedure TForm1.RadioGroup3Click(Sender: TObject);
begin
case RadioGroup3.ItemIndex of
```

```
0: edit1.Font.Color:=clGreen;

1: edit1.Font.Color:=clBlue;

2: edit1.Font.Color:=clRed;

3: edit1.Font.Color:=clYellow;

4: edit1.Font.Color:=clBlack;

end;

end;
```

We enter the following code inCheckListBox1 components from Events features OnClick:

```
procedure TForm1.CheckListBox1Click(Sender: TObject);

begin

if checklistbox1.Checked[0] then

Edit1.Font.Style:=Edit1.Font.Style+[fsStrikeOut]

else Edit1.Font.Style:=Edit1.Font.Style-[fsStrikeOut];

if checklistbox1.Checked[1] then

Edit1.Font.Style:=Edit1.Font.Style+[fsUnderline]

else Edit1.Font.Style:=Edit1.Font.Style-[fsUnderline];

 end;
```
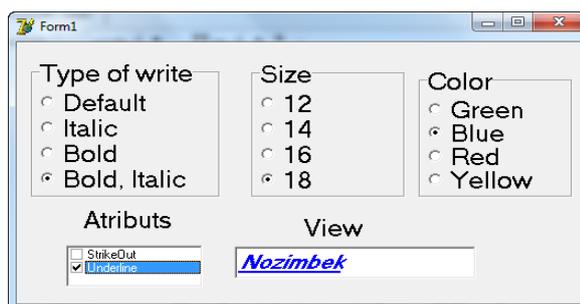

Figure 4: We push the buttonF9 and open the programme and write the text in Edit1 and chose the printing type.

(Common component of printing type window)

You can also create tables using the Delphi database. The user can create table columns in optional database management systems (via Alias, Access, phpMyAdmin, Paradox, Dbase). Alias is the table belonging to a particular group, which holds the category and the path to the tables. Now we are going to look at the Access Database table to the Delphi application. First, Access creates a table with the following field names:

Access Name	Type
DatabaseName:	base.accdb
Table name:	state
Name	Короткий текст
Captial	Короткий текст
Nationality	Короткий текст
Region	Короткий текст
Add_Photo	Поле объекта OLE

After creating the database columns, launch the Delphi application, the ADO folder ADOConnection and ADOQuery components, the DataSource component from the Data Access folder, the DBGrid component from the Data Controls folder, the ComboBox, four Button, four Edit, six Label components. , Component Image from the Additional folder, OpenPictureDialog components from the Dialogs folder. The following figure changes the Caption properties of Button and Label components
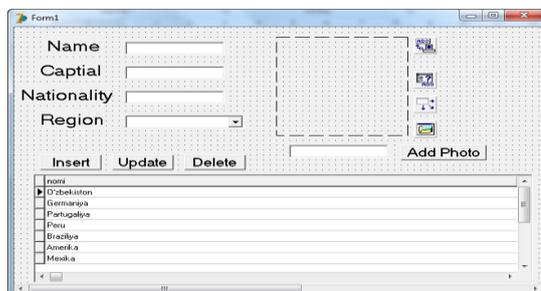
Figure 5: ADOConnection, ADOQuery, DataSource, DBGrid

The following features change the ADOConnection, ADOQuery, DataSource, DBGrid components that were embedded in the Delphi application. ADOConnection component from ConnectionString feature we enter Build, Microsoft office 12.0 Access Database Engine OLE DB, Forward, data source file way, name extension and we chose OK button.

Connected:	True
LoginPrompt:	False
ADOQuery	
Connection	ADOConnection1
SQL	select *from state
Active	True
DataSource	
DataSet	ADOQuery1
DBGrid	
DataSource	DataSource1

We enter the followings from Insert button Events features OnClick .

```
Uses
Jpeg;
var
  Form1: TForm1;
Stream:TMemoryStream;
Jpeg:TJpegImage;
procedure TForm1.BitBtn1Click(Sender: TObject);
begin
ADOQuery1.Append;
adoquery1.FieldByName('name').AsString:=Edit1.Text;
```

```
adoquery1.FieldByName('captial').AsString:=Edit2.Text;

adoquery1.FieldByName('nationality').AsString:=Edit3.Text;

adoquery1.FieldByName('region').AsString:=ComboBox1.Text;

TBlobField(ADOQuery1.FieldByName('add_photo')).LoadFromStream(stream);

ADOQuery1.Post;

ShowMessage('information is uploaded');

end;
```

We enter the following from Add Photo button from Events features OnClick :

```
begin

if OpenPictureDialog1.Execute=true then

begin

Edit4.text:=OpenPictureDialog1.FileName;

Image1.Picture.LoadFromFile(edit4.Text);

end;
```

We enter the followings from DBGrid component Events features OnCellClick :

```
begin

Edit1.Text:=adoquery1.FieldByName('name').AsString;

Edit2.Text:=adoquery1.FieldByName('captial').AsString;

Edit3.Text:=adoquery1.FieldByName('nationality').AsString;

ComboBox1.Text:=adoquery1.FieldByName('region').AsString;

Jpeg:=TJpegImage.Create;

stream:=TMemoryStream.Create;

TBlobField(ADOQuery1.FieldByName('add_photo')).SaveToStream(stream);

Stream.Position:=0;

Jpeg.loadfromstream(stream);

Image1.Picture.Graphic:=Jpeg;

end;
```

We enter the followings from Update button Events features OnClick:

```
begin

ADOQuery1.edit;

adoquery1.FieldByName('name').AsString:=Edit1.Text;

adoquery1.FieldByName('captial').AsString:=Edit2.Text;

adoquery1.FieldByName('nationality').AsString:=Edit3.Text;

adoquery1.FieldByName('region').AsString:=ComboBox1.Text;

TBlobField(ADOQuery1.FieldByName('add_photo')).LoadFromStream(stream);

ADOQuery1.Post;

ShowMessage('Ma`lumot joylashdi');

end;
```

We enter the followings choosing Delete button from Events featuresOnClick:

```
begin

if (Application.MessageBox('Do you really want to delete?',
```

```
'window title',MB_YESNO or MB_ICONQUESTION))=idyes then

ADOQuery1.Delete;

end;
```
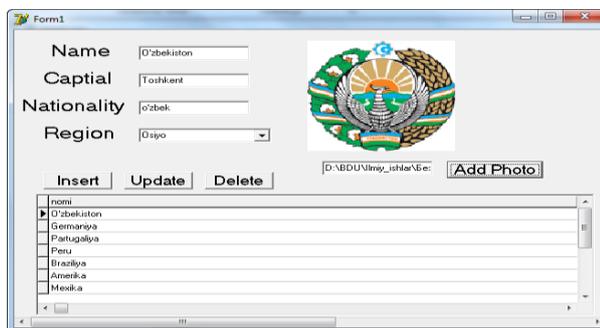

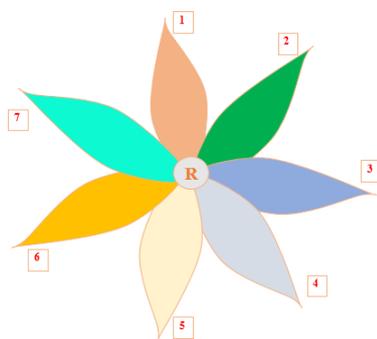**Figure 6:**(the database will be filled out by this app)

The basis of the use of gaming technologies is active and accelerated activity of students. According to scholars opinion, games are one of the main activities, together with work and study. Psychological mechanisms of gambling activities rely on the fundamental needs of the individual to become self-centered, to secure his place in life, to be self-directed, to fulfill his potential input, strengthening, training, control. The games are aimed at different purposes. They are used for didactic, educational, activity-generating and socializing purposes. The didactic goal of the game is to extend knowledge, skills, skills, skills, knowledge and skills in the practical activities, the development of general education and skills, and the development of job skills. The educational purpose of the game is to cultivate independence, the will, the development of specific approaches, attitudes, spirituality, aesthetics and worldview, collectivism, socialization, and communication. The use of games in the learning process should not be used to please students. It must be didactic, that is, to follow specific educational tasks that are addressed in the lesson. Therefore, the game is pre-planned, the lesson is carefully thought out of the lesson structure, the form of the course is laid out, and the games are made accordingly. Games technologies are as effective as other forms and methods of teaching. The aim of the game should be to give the student a modern level of knowledge in any subject, particularly computer science.

The use of the "Sunflower Flower" nomenclature for memorizing programming languages and learning their functions improves teaching efficiency. The method, called "Sunflower Flower," looks like this, and the reader writes the word that ends with the last letter "R" in the programming languages. This method can be used to divide the class into two groups or for each student (database will be filled out by this app).

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Figure 7: Sunflower flower method

When grouping is done in groups, one correct answer is given for each correct answer. At the end of the recording fields, the number of groups in the group is counted, and the group with the most number is the winner.
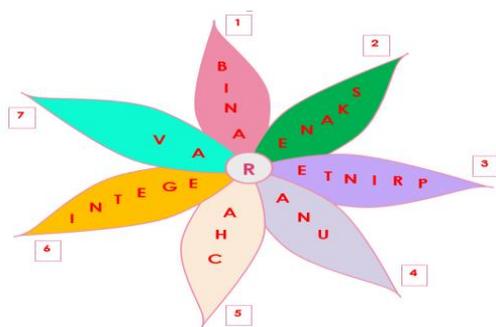
Figure 8:(Sunflower flower method)

Another approach to teaching programming languages is the use of the "Puzzles" method of teaching. There are a number of software programs that use this method, one of which is implemented below with the Jigsaws Galore software. First of all, the theme pictures are selected and the program is selected to divide the picture into sections. The following is a step-by-step method that can be used in the practical exercises on the Windows Keypad. The group consists of 24 students. As the method is pre-planned, the room is equipped with two round tables, designed to work in small groups. Class students can be divided into several groups. The number of groups is the same, so that they are placed at a table corresponding to the number written in this section.
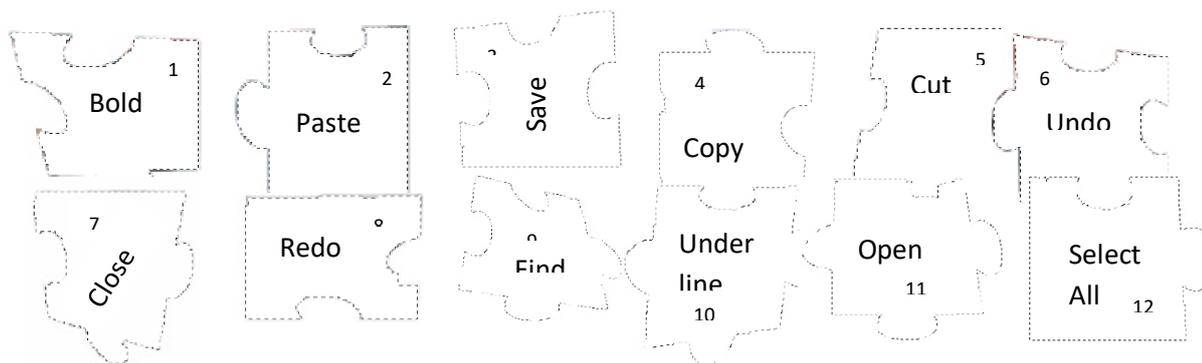
Figure 9: table corresponding

(The order of each part number)

Students will be given 2 minutes to prepare after painting the slices. When the time is up, one student from each group answers the question he or she chooses. For each correct answer 1 point is given, -1 for each wrong answer.

Figure 10: painting the slices

(Preview sections)

When a member of the group responds correctly, a piece of pencil in their hands is collected on a blackboard or an electronic whiteboard (using a computer or projector). The first group will be the winner of the group, which will have a full picture. If the strengths of the groups are equal, the group members need to be able to provide specific information, depending on the picture.

Figure 11: piece of pencil in their hands

The "puzzle" method

Using the above techniques can be seen as one of the forms of active learning. Such courses involve the creative approach of teachers and students, the development of skills in the process of active cognitive activity of students, and the development of skills and abilities to use game technologies in their future pedagogical activities. Organization and conduct of training using gaming technologies is an important basis for understanding and retaining the terms used for the material being studied. As a result of gaming technology, students' cognitive development is enhanced, their interest in learning material is also enhanced. One of the most pressing problems of today is training young people to think independently and freely.

Currently, modern methods of teaching are widely used in the educational process. The use of modern teaching methods can lead to greater effectiveness in teaching. It is advisable to choose these techniques based on the didactic function of each lesson. Today, in some developed countries, the methods that provide the basis for a great deal of experience in the use of modern pedagogical technologies that guarantee the effectiveness of the educational process are called interactive methods. Interactive teaching methods are widely used in all types of educational institutions. At the same time, there are many types of interactive teaching methods, and there are many methods available for the implementation of almost any educational process. In practice, it may be appropriate to isolate techniques for specific purposes. This situation has led to the problem of choosing the right methods of interactive learning for a particular purpose. For this purpose, the organization of the classroom process, the motivation of the learner to increase the interest of the learner, their constant encouragement in the learning process, the breakdown of the material into small pieces, and the discovery of their content and using techniques such as attack, working in small groups, discussion, problem-solving, referral text, project, role-playing, and encouraging learners to carry out practical exercises independently. An interactive method is to work together to solve an activity or problem through dialogue, discussion and discussion. The advantage of this method is that the whole activity prepares students for independent thinking and prepares them for independent living. Currently, one of the most popular interactive teaching methods is Case Study (or Case Studies). The use of case studies develops students' thinking skills and links the learning process to production.

Purpose: Each user can access or post information in their personal cabinet.

Condition Statement: The user logs their resources into the Moodle system using a computer, modem, or telephone network to connect to the Internet. Resources include testing, glossary, lectures, labs, practical exercises, videos, audio files and more.

Case issue: Does Moodle accept over 150 MB files? How expensive are Internet services? What should the user do to meet the requirements? How do I upload files to Moodle? How to use the Internet?

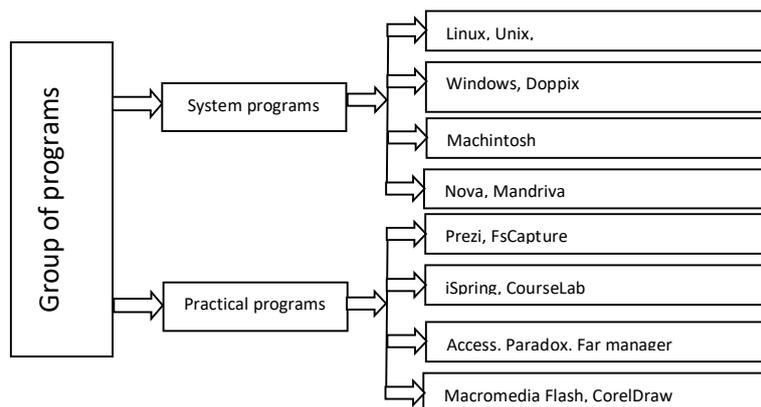Second Key Task: Divide into the groups the following software providers.

Task 1:"Moodle Support Equipment"
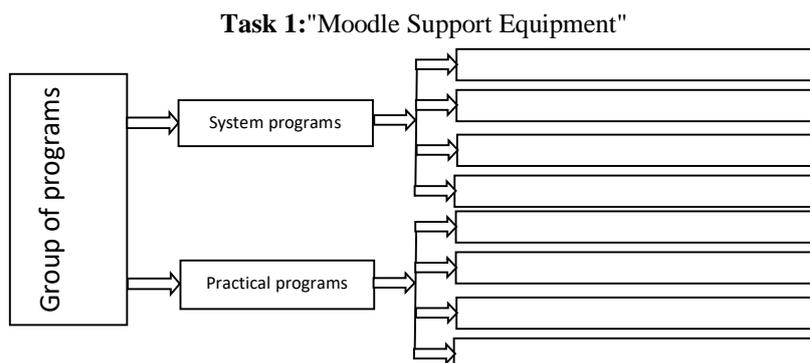
Software names:

1. Linux, Unix, Prezi, FsCapture;   4. Paradox, Far manager, Macintosh;

2. iSpring, CourseLab, Windows;   5. Mandriva, FoxPro, Chrome, Opera;

3. Doppix, Mandriva, Access;   6. Macromedia Flash, Nova, CorelDraw;

Teacher answer:

Task 2: Break the program into teams.

III.   CONCLUSION

Interactive teaching methods are often used in conjunction with various forms of training. These technologies can be applied in different stages of the course, depending on the subject matter and the content of the subject. A number of game technologies have been developed that are very effective in teaching science, taking into account the age characteristics of schoolchildren. Usually, the main activities of a person are in three types: labor activity, game activity, educational activities. They are all interconnected. The laws of the formation of students' mental behavior based on school materials are included in the game activities. Applying these techniques will increase the activity of the participants and improve the quality of education.

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