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# The comprehensive research of students' preferences in the electronic educational environment of the high school

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***The problems of user modelling are described. The system for evaluation user's preferences is developed.***

***Keywords. Ergonomics, Human-Computer Interaction, user.***

## I. INTRODUCTION

Ergonomic support of e-learning allows to improve the efficiency of the dialog interaction in the "student-to-computer" system.

The account of user's preferences in developing interface and dialog procedures is significantly increase the value of user's comfort and reduces the number of failures from activities when interacting with the system. [1-3].

In [2-3] has been developed the concept of an agent-manager of ergonomic support of e-learning.

The topical task is determination of user's preference and individual psychophysiological characteristics.

## II. BASIC RESEARCH

### 2.1. Basic statements

To solve the problem of determining user preferences and psychophysiological characteristics, a subsystem was developed with the next main functions:

- Testing the student's psychophysiological characteristics;
- Determination of the student's preferences through the presentation of fragments of educational material of different modalities;
- Maintaining a database of test results;
- -Preparing reports based on the results of testing.

### 2.2. The forming of psychophysiological component (PPC) of user's model

In [4, 5] are determined the psychophysiological characteristics of the user, which have a significant effect on the effectiveness of human-machine interaction during the learning process in the student-computer system.

They include:

- modality;
- temperament;
- level of endurance of the nervous system;
- type of nervous system;
- neuroticism;
- fatigue, etc.

Test methods have been defined that allow quickly obtain the values of the above described parameters of the PPC user's model.

The main requirements for test methods are time and ease of execution.

### 2.3. The subsystem of forming PPC user's model.

At present in subsystem were created the next test methodology:

- VAK-questionnaire – the determination of the preferred modality;
- The definition of preferences by viewing samples of educational material of different modalities;
- A Raven Matrices Test - determination of the level of intelligence;
- Eysenck Personality Questionnaire – the definition of temperament.

### 2.4. The use of testing subsystem

Knowing the dominant channel of information perception training can be made more effective [4].

15 students of the Sumy State University took part in the experiment. Results of answer interpretation for preference defining are presented on Figure 1.

V- Visual preferences.

A- Audio preferences.

R – Reading preferences.

K – Kinesthetic preferences.

Processing of VARK-questionnaire results showed that prevail students with mixed modality. The vast majority of students have prevailing audiological modality.

Results of answer interpretation are presented on Figure 2.

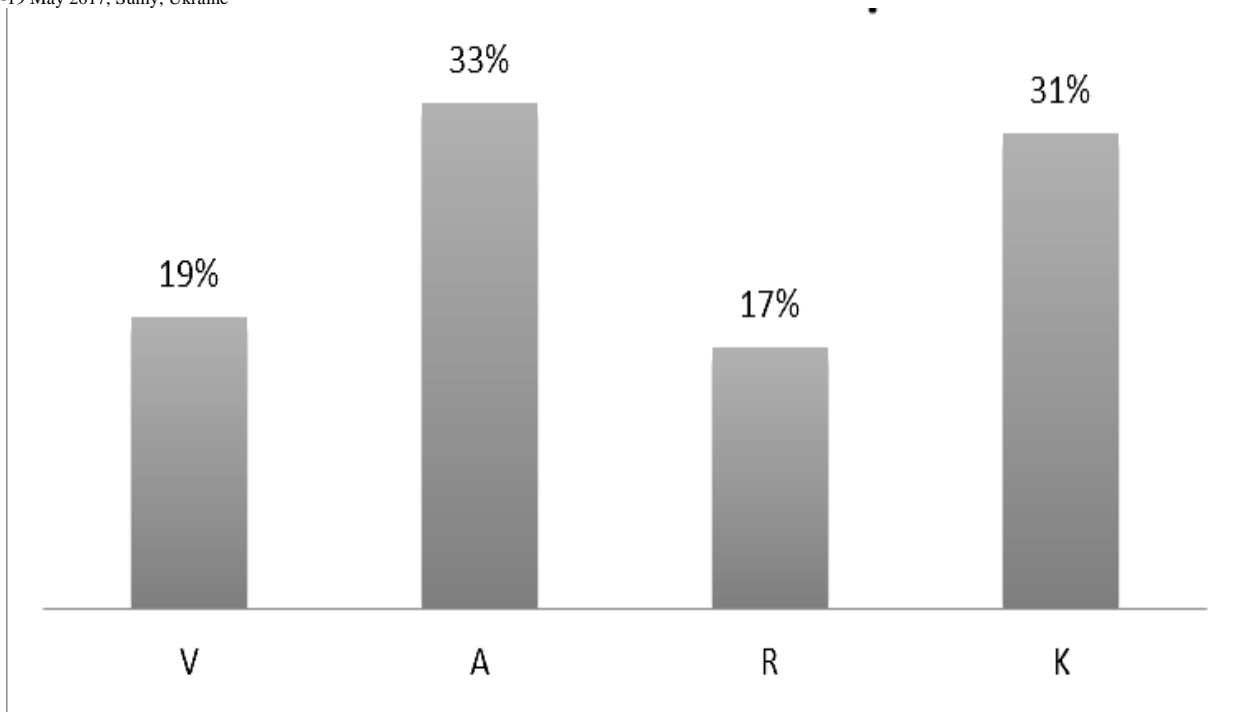


Fig.1 Video chart of the results of testing user's personal preferences

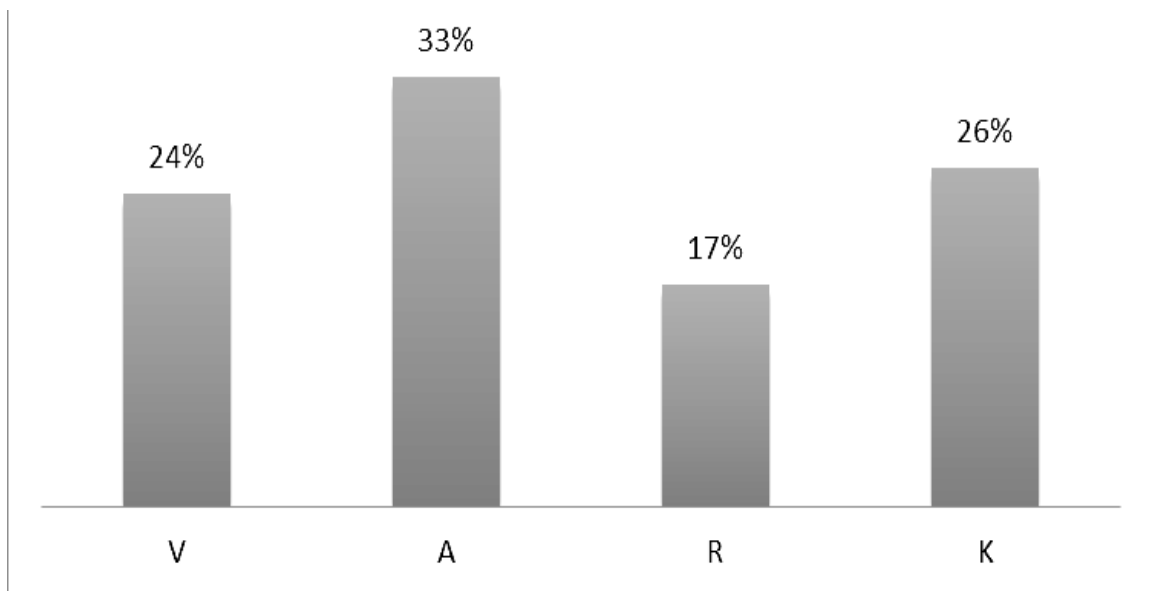


Fig.2 Video chart of the results of VARK testing

The results of the answers interpretation of the Eysenck Personality Questionnaire for determining the temperament are shown in Figure 3. There are four types of temperament: choleric, sanguine, phlegmatic, and

melancholic. As a result of testing among students the phlegmatic type of temperament prevails.

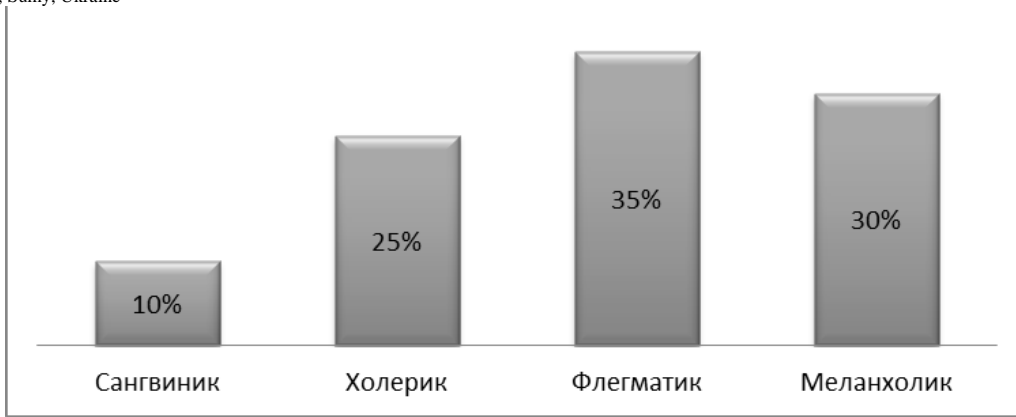


Fig.3 Video chart of the results of Eysenck Personality Questionnaire

Among the 5 degrees of intelligence, the vast majority among the students tested has a third degree. The results of the interpretation of the responses to Raven Matrices Test to determine the level of Intelligence are shown in Figure 4.

Interpretation of degrees is as follows:

1 degree - very above average (subject has highly developed intellect);

2 degree - above average;

3 degree - the average intellect;

4 degree - the intellect is below average;

5 degree - defective intellectual ability.

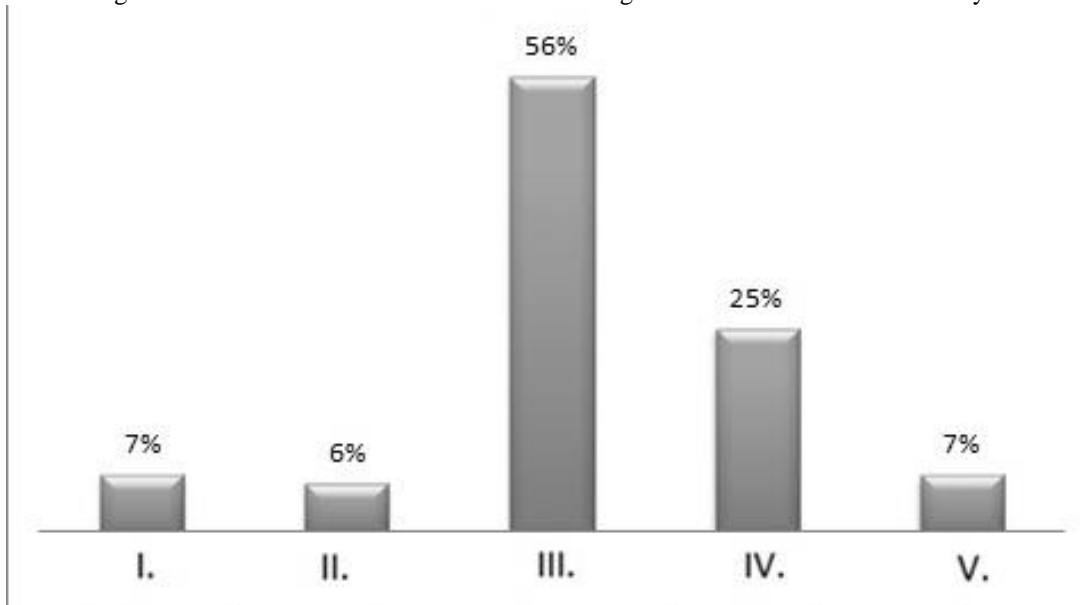


Fig.4 Video chart of the results of a Raven Matrices Test

### III. THE DIRECTIONS OF FURTHER STUDY

To form a user model, it is advisable to use a test system that includes: modality, a Raven Matrices Test, Eysenck Personality Questionnaire.

The next stage of study is an integration into the real learning systems.

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