and external factors (the speed of the solar wind SW and the density of its proton component n). Corresponding values of multiplier correlation coefficient and reliability level are as follows: \( R^2 = 0.7 \ldots 0.93 \) \((p < 0.01)\), \( R^2 = 0.95 \ldots 0.97 \) \((p < 0.001)\), \( R^2 \eta = 0.88 \ldots 0.91 \) \((p < 0.01)\), \( R^2 \eta = 0.95 \ldots 0.97 \) \((p < 0.01)\).

**Conclusions.** The use of information and communication technologies allows to carry out psychological and psychophysiological researches of cognitive possibilities of a pupil in conditions of school learning. Accounting of external and internal factors allows to predict the student adaptive ability to the learning process, the level of mental performance, and therefore the success of solving cognitive tasks of different types.

**References**

5. Ratynska O. Mental capacity to work of senior pupils in different weather types. – Manuscript. Scientific thesis for the Degree of the Candidate of Biological Sciences in the speciality 03.00.13 – human and animal physiology. – Kyiv National University named after Taras Shevchenko, Kyiv, 2005.

**Анотация.** Буров О.Ю., Пинчук О.П., Соколюк О.М., Перцев М.А. Моделювання пізнавальної діяльності старшокласників з використанням ІКТ. Розглянуто проблеми, пов’язані з моделюванням виконання когнітивних завдань старшокласниками під впливом змін внутрішніх та зовнішніх факторів. Розроблена ІКТ дозволила встановити інтер-персональні та інтра-персональні зміни показників ефективності та надійності виконання когнітивних тестів протягом часу обстеження (1,5 місяця при тестуванні 3 рази на тиждень).

**Ключові слова:** інтелект, оцінювання, експериментальні дослідження, комп’ютерні засоби.

**Annotaція.** Буров О.Ю., Пінчук О.П., Соколюк О.М., Перцев М.А. Моделювання пізнавальної діяльності старшокласників з використанням ІКТ. Розглянуто проблеми, пов’язані з моделюванням виконання когнітивних завдань старшокласниками під впливом змін внутрішніх та зовнішніх факторів. Розроблена ІКТ дозволила встановити інтер-персональні та інтра-персональні зміни показників ефективності та надійності виконання когнітивних тестів протягом часу обстеження (1,5 місяця при тестуванні 3 раза в тиждень).

**Ключові слова:** інтелект, оцінювання, експериментальні дослідження, комп’ютерні засоби.

**Abstract.** Burov O.Yu., Pinchuk O.P., Sokolyuk O.M., Pertsev M.A. Modeling of cognitive activity of high school children using ICTs. The problems associated with modeling the performance of cognitive tasks by high school students under the influence of changes in internal and external factors are considered. The developed ICT allowed to establish inter-personal and intra-personal changes in the indicators of efficiency and reliability of performing cognitive tests during the survey period (1.5 months when tested 3 times a week).

**Key words:** intelligence, measurement, experimentation, computer tools.

Mykhailo Pertsev
Cleverdia, Ltd., Ukraine

**ICT ASSESSMENT OF INTELLECTUAL DEVELOPMENT OF A PUPIL FOR THE DIFFERENTIATION OF TRAINING IN THE RESEARCH DIRECTION**

**Statement of the problem.** Development of technologies in the XX century has posed to teachers the issues of modernizing the class-lesson system of training, taking into account the capabilities and needs of the pupil as much as possible. One of the approaches to solving this problem is differentiated education, a kind of which can be specialized education, which is popular and legally supported in Ukraine.

79
It should be noted that besides the concept of "differentiation of training" there is a "differentiated training" that is identical in the opinion of a number of scientists, but these concepts should be distinguished. A number of authors (S.V. Goncharenko, V.M. Volodko, P.I. Drobiazko, I.S. Yakimanska and others) consider differentiated training as a form of organization of cognitive activity of pupils at a school where they are grouped, and learn according to different programs and plans, taking into account their individual diversity.

Analysis of recent research and publications. During the last century, a search for balancing frontal, group and individual training has been conducted. This problem has become particularly acute in the last decade with the expansion of the role of the synthetic training environment [1], including with the use of social networks [2]. An important aspect is taking into account the peculiarities of intellectual and personal development of adolescents [3], as well as their talent [4], which is receiving more and more attention at the global level.

The goal of the work. An analysis of approaches to the differentiation of training for research-gifted high school pupils and the development of ICT-based methods for assessing their cognitive abilities.

The state of the question. For several decades, various forms of differentiated training have been introduced into educational practice, but there are not so many researches devoted to this issue. There is no generally accepted approach to the essence of the concept. It is also not established how differentiation affects the development of intelligence and the intellectual profile in particular. For example, the notion of "differentiation" is defined as: 1) separation, branching, stratification of the whole into different parts, forms, steps; 2) occurrence (in an organism or its separate section) of morphological and functional differences in the course of development [5].

Most often, differentiation is associated with such an organization of the educational process, which is characterized by the variability of content, methods and intensity of training, or interpreted as a special form of organization of training and communication between teachers and pupils, taking into account the individual and psychological characteristics of pupils [6, etc.]. Orientation to the individuality of the pupil requires that the differentiation of training takes into account the internal needs of schoolchildren. Therefore, it is often understood as a system that underlies the teaching and educational process and is aimed at the implementation of an individual approach to training.

The most widely recognized are the following types of differentiation: external and internal. The external one affects the very structure of training and involves taking into account the characteristics of pupils through their association into separate groups. It can be implemented in different forms: the redistribution of ordinary classes in accordance with the level of pupil achievement and the nature of the requirements for training; organization of special classes and schools for education of children with a deep interest and ability to a certain field of knowledge; organization of groups for which the curriculum is adapted to the interests and needs of pupils; optional education (compulsory or voluntary), which may include in-depth study of compulsory subjects, the study of additional subjects or their optional study. Under the internal differentiation (differentiation at the micro level), many scholars understand the use on classes of children of one class of different methods and tools that ensure the maximum development of abilities, inclinations, satisfaction of the cognitive needs and interests of each pupil. If the educational process is based on the characteristics of each pupil (and not groups), then we should talk about individualization - the marginal variant of differentiation.

Differentiation in the content of education: profile and level differentiation. In this case, more attention is paid not to the organizational aspect of training, but to its content. At present, the differentiation of training is considered, first of all, as a means of conducting profile education, building an "individual educational route". Taking into account the global trend towards the development of pupils' research competencies, internal level differentiation can be an effective form of training in the current legislation of Ukraine. And organizationally it is expedient to perform it in the form of extracurricular (out-of-school) project-oriented activities with the prior identification of intellectual and personal capabilities of pupils [7].

Results of the work.

Developed under the guidance of O. Yu. Burov, the ICT of assessment of senior pupils' abilities was used for the survey of pupils of grades 7-11 (more than 3500 pupils). The indexes of the structure of intelligence, personality, psychotypological indicators were evaluated. Based on the developed technology of data analysis, who were prone to the form of extracurricular (out-of-school) effective form of training in the current legislation of Ukraine. And organizationally it is expedient to perform it in the global trend towards the development pupil's research profile and level differentiation. In this case, more attention is paid not to the organizational aspect of training, but to its content. At present, the differentiation of training is considered, first of all, as a means of conducting profile education, building an "individual educational route". Taking into account the global trend towards the development of pupils' research competencies, internal level differentiation can be an effective form of training in the current legislation of Ukraine. And organizationally it is expedient to perform it in the form of extracurricular (out-of-school) project-oriented activities with the prior identification of intellectual and personal capabilities of pupils [7].

References
Анотація. Перцев М.А. ІКТ оцінювання інтелектуального розвитку учнів для диференціації навчання в дослідницькому напрямі. Розглянуто проблеми, пов’язані з оцінюванням розвитку інтелекту старшихкласників та використанням результатів для диференціації навчання, зокрема, в дослідницькому напрямі. Наведено загальні характеристики сучасних поглядів на диференціацію навчання та роль індивідуалізації як її граничної форми.

Ключові слова: інтелект, оцінювання, диференціація навчання, комп’ютерні засоби.

Abstract. Pertsev A.M. ICT for assessment of intellectual development of a student for the differentiation of learning in the research direction. The problems related to the assessment of the development of the intelligence of senior pupils and the use of results for the differentiation of learning, in particular, in the research direction, are considered. The general characteristics of modern views on the differentiation of education and the role of individualization as its boundary form are given.

Key words: intelligence, measurement, differentiation, computer tools.