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PERSON-CENTERED APPROACH TO ORGANIZING A STUDY GROUP OF COMPUTER SCIENCE WITH GIFTED SCHOOLCHILDREN

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In the article the main factors (dialogical, creative, professional and reflexive), the observance of which contributes to the productive implementation of a personally oriented approach, are analyzed. The authors have identified these factors as psychological and pedagogical prerequisites for the implementation of a personally-oriented approach to learning, providing assistance to students in order to improve their self-esteem, achievement of self-confidence, inspiration in the intellectual and emotional process of discovering his/her own personality (including traits) in the sphere of knowledge and development of talents. The article reveals the essence of the concept of "extracurricular activities" and distinguishes its advantages over the conventional school educational process. The authors emphasize that this type of activity allows to clearly reveal the needs of students, enables them to act in new social roles. The article determines that the most common group form of organization of extracurricular work is a circle (work group); the main types of circles in computer science are described and discussed. On the basis of experience of "Applied software" work group (circle) the authors have formulated the skills and abilities the pupils are to acquire during their extracurricular activities. The authors described the ways to implement a person-centered approach when organizing group work. The article concludes that the involvement of gifted students in various projects within the circle work helps them develop teamwork cooperation, deepen their knowledge and improve their skills in both computer science and other subjects, as well as to open new facets of knowledge concerning the surrounding world. In the long run pupils lean to adapt to different conditions of their future profession, as well as to perceive themselves as highly-qualified specialists.

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ОСОБИСТІСНО ОРІЄНТОВАНИЙ ПІДХІД ПРИ ОРГАНІЗАЦІЇ ГУРТКА З ІНФОРМАТИКИ З ОБДАРОВАНИМИ ШКОЛЯРАМИ

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У статті проаналізовано основні фактори (діалогічний, творчий, професійно-рефлексивний), дотримання яких сприяє продуктивній реалізації особистісно орієнтованого підходу. Ці фактори автори визначили як психолого-педагогічні передумови реалізації особистісно-орієнтованого підходу до навчання, надання допомоги учням з метою підвищення їх самооцінки, досягнення впевненості в собі, натхнення в інтелектуальному та емоційному процесі пізнання, розкриття власної особистості (зокрема здібностей) у сфері пізнання та розвитку талантів. У статті розкрито сутність поняття "позанавчальна робота" та виділено її переваги в порівнянні з звичайним шкільним освітнім процесом. Автори наголошують, що цей вид діяльності дозволяє чітко розкрити нахили учнів, дає їм змогу діяти в нових соціальних ролях. У статті визначено, що найпоширенішою групою формою організації позакласної роботи є гурток; описано та обговорено основні види гуртків з інформатики. На основі досвіду роботи гуртка "Прикладне програмне забезпечення" автори сформулювали уміння та навички, якими учні мають набути під час позакласної роботи. Автори описали шляхи реалізації особистісно орієнтованого підходу при організації групової роботи. У статті зроблено висновок, що залучення обдарованих учнів до різноманітних проектів у рамках гурткової роботи сприяє розвитку командної взаємодії, поглибленню знань і вдосконаленню навичок як з інформатики, так і з інших предметів, а також відкриває нові грані знань про навколишній світ. У перспективі це дасть можливість учням легше адаптуватися до різних умов своєї майбутньої професії, а також сприймати себе як висококваліфікованих спеціалістів.

Ключові слова: *обдаровані школярі, особистісно орієнтований підхід, позанавчальна робота, навчальний гурток, інформатика.*

Introduction of the issue. There is a need for extraordinary creative individuals to be able to adequately perceive change itself and to implement quality innovations, non-standard thinking, bringing new meaning to social, cultural, industrial life, define and solve future tasks in the near future. The problem of ensuring personal, social self-realization and professional self-determination of the young generation individuals in the new socio-economic conditions needs further solution. It determines the need to upgrade the educational process.

Changes in society set new demands on all participants in the educational process. It is a teachers' duty to create favorable psychological and pedagogical conditions for the maximum development of abilities of each student, realization of his/her creative potential, adherence to the principle of multivariate

forms and methods of organization of educational, cognitive and extra-curricular activity. First of all, it is about introducing a person-centered approach in education, the conceptual basis of which is the observance of subject-subject relations of teachers and students as self-sufficient equal partners, taking into account their natural inclinations and individual differences.

There is a rapid tendency to decrease the interest of young people both in the process of schooling in general and in the study of specific subjects, including computer science at nowadays. There is a contradiction between the reluctance of students to study computer science as a school subject and the challenges of a modern society that is gradually and confidently acquiring signs of complete informatization. At the same time, there is a growing interest of pupils in various

non-formal learning activities, including study groups, as well as commercially organized ones.

Current state of the issue. The analysis of scientific achievements of scientists shows that the theoretical foundations of personal orientation of the educational process were devoted to the work of a considerable amount of scientists (I. Zyazyun, S. Podmazin, V. Serikov, S. Sisoyeva, N. Talyzina etc.) [4; 6; 8]. Particular attention was paid to the peculiarities of organizing the educational process for the development of ability in works of such scientists as G. Kostyuk, A. Leonyyev, O. Matyushkin, V. Molyako, S. Rubinshtein, B. Teplov, P. Torrains and other [3]. The content of the computer science course in this context was analyzed by M. Zhaldak, T. Vakaliuk, Ya. Glynsky, A. Gurzhiy, V. Monahov, N. Morze, Yu. Ramskiy, O. Spirin, Yu. Trius etc [7]. It can be concluded that the pedagogical support of a gifted child in the educational process requires continuous improvement and involves the introduction of basic principles of person-centered learning.

Aim of research. Considering the urgency of the issue the main aim of this article is to define the basic principles of a person-centered approach for organizing a study group in computer science with gifted students.

Results and discussion. Determining the teacher and the student as subjects of the educational process and adherence to a quantity of factors, such as: dialogical, creative, professional and reflexive, contributes to the productive realization of the basic principles of person-centered education. Subject-subject relations involve the creation of an environment of trust and understanding in the class. Person-centered education can be implemented while maintaining the dialogic interaction between the teacher and the student. It aims to support and encourage student's natural desire to learn, create their own algorithm of activity, choosing ways, methods, techniques, content of educational material that satisfies his/her requests. Creative factor gets of particular

importance in the context of this approach and involves the reorientation of the teacher's function from a subject-illustrative to a facilitative (by K. Rogers) in the process of creative equal interaction with the pupil. In our opinion, relevant in this context is the provision of pedagogically appropriate influence of a teacher, which V. Sukhomlinsky called it a "harmony of pedagogical influences" [6]. The professional factor in the organization of the educational process requires that the personality of a teacher meets the high requirements that objectively reflect the psychological essence of his/her activity as integral and socially significant in modern community. The modern teacher must be a conscious subject of the educational process and an active participant of scientific, technical and social progress. The reflexive factor indicates the importance of the influence of the teacher's personality on the essence, content, method of his/her activity. It is about the psychotherapeutic nature of pedagogical activity, and the priority of comfort of the mental state of both parts.

The psychological and pedagogical self-regulation of a teacher includes: positive attitude towards children in general; a sense of satisfaction from communicating with them; psychological, professional, methodical readiness of a teacher to work with children of a particular age; the ability to experience children's problems as their own; high level of empathy; a teachers' psychological readiness to communicate and collaborate with a specific class (the ability to identify "psychological personality" class, which is defined as "quasi-person"); the psychological focus of a teacher on the main goal of the lesson; readiness for emotional action, interest in achieving the set goals; confidence in himself/herself and students; the teacher's moral qualities, such as his/her tact, positive attitude to the students, pedagogically perfect form of communication [8].

The combination of all these factors creates the psychological and pedagogical preconditions for the implementation of a person-centered approach to learning, provides

assistance to pupils with their self-esteem, develops self-confidence, inspiration in the intellectual and emotional process of discovering oneself in the sphere of knowledge, development of talent. At the same time, we proceed from the understanding of giftedness as an individual potential peculiarity of internal (inclinations), external (favorable social environment) and personal (positive "I"-conception, presence of appropriate volitional qualities, orientation, perseverance, etc.) prerequisites for the development of personality abilities to a level higher than conventionally "medium", through which it can achieve significant progress in specific areas of activity [1], including the field of information technologies.

A special place in the implementation of natural dispositions, abilities and talents of students is played by extra-curricular activities, which is a set of various activities of students of educational nature, which are organized and carried out after school. The main purpose of extra-curricular activity in all its forms is engaging students in research and community services, stimulating their initiative and independence, in the development of individual interests and abilities, formation needs in cognition, conscious, enthusiastic attitude to effective direct sources of knowledge, development of creativity, improving knowledge, expanding outlook, enriching the students' experience; disclosure, development and expansion of interests; forming students' thinking, ability to share knowledge, promotion of professional and personal self-determination, organization of comfortable communication, cooperation, stimulation of schoolchildren to self-education and "smart" leisure. Such activity allows to clearly reveal the needs of students, as well as to enable them to put on new social roles. It is a special sphere where students can satisfy their personal needs for self-examination, self-testing. This is an area of active communication in which the need for communication is met. Spare time is a condition for expanding the outlook of schoolchildren, conducting independent creative search, as well as to

deepen the emotional perception of modern life.

Despite its close connection with teaching, extra-curriculars have a number of differences that make it attractive to students:

- participation in extracurricular work is not compulsory, while the training sessions are mandatory;
- extra-curricular activities are easy-going;
- a variety of extra-curricular activities exclude control in the form of assessment of skills and knowledge;
- extra-curricular activity, in comparison with academic work, gives greater opportunities for schoolchildren to show their independence, initiative and creativity.

The most common group form of organization extra-curricular' work is a society. It is a non-coercive grouping of pupils who show increased interest in a particular area of expertise and want to practice. Classes of group study are characterized by the curriculum, are held on a regular basis and the defined profile of work.

Group study of computer science have different orientation according to various functions and features of computer: graphics, programming, modeling, web design, etc. The group classes are held in different forms: reports, featured events, quizzes, project work, excursions, production of visual materials and equipment for classrooms, laboratory classes, meeting with computer specialists, virtual trips, etc.

Considering a more detailed review of the organization of the group study work on the example of the "Applied software", which is aimed at comprehensive preparation of gifted pupils for research in the field of computer science, in-depth study of various types of modern software in particular. Mastering the course harmoniously combines the study of modern software together with assimilating methodology, including modern methods and means of scientific research.

The basic tasks of the group study are to form such competences:

cognitive: mastery of modern types of software; familiarization with the methodology (including the methodology scientific research), in particular in the field of computer engineering; formation of scientific outlook, modern scientific thinking;

practical: the formation of skills for scientific and research work, planning and organization modeling and computational experiment, processing of experimental results, independent study of scientific literature, selection, analysis, cataloging research materials and registration of research results;

creative: development of searching, inventive, research, creative activity; technical thinking; formation of skills of independent choice of methods of work, direction of scientific research; ability to navigate the information space, to find non-typical solve complex scientific problems;

social: the formation of constant interest in scientific research and creative initiative; development of positive qualities of emotional-volitional sphere of personality (diligence, perseverance, responsibility, ability to make and substantiate own decisions); upbringing of students' conscious attitude to future professional activity in the conditions of wide informatization of society.

The content of work of the group study is designed for two semesters. Pupils are introduced to basic general-purpose software, basic concepts of research activities and methodology of scientific research, learn to correctly (as required) cataloging and registering scientific work in the first semester. Each student chooses the subject of scientific research, makes the plans of future activities, analyzes the sources of information, defines the purpose and main objectives of the study, chooses methods and means of research, prepares scientific work and submits it to participate in the regional, national and international scientific contests, for example the Junior Academy of Sciences of Ukraine, "Star Way" etc. While preparing for the contests and other competitions in computer science in the

second semester the schoolchildren master a specialized software. An analysis of the scientific research by the students under the guidance of a teacher is also planned at this stage.

When conducting group study work, both theoretical and practical classes are provided, between which continuity is ensured. Discussion of educational material by students, exchange of opinions takes place at seminars. Schoolchildren gain experience in public speaking, conducting scientific debates and substantiating their point of view.

Methods of presentation of educational material are determined by a teacher and based on topic of classes, level of students' training and awareness. The following methods can be used: demonstration of examples, heuristic conversations, comparative analysis, widely used technical training, audiovisual and multimedia technologies in conducting theoretical classes. Interactive methods are preferred including brainstorming, roundtable talks, generating ideas, "educational discussion". In practical classes the teacher use methods of educational projects, programmed learning, etc. Open source software is used to study software development tools.

In the context of the realization of the main factors of person-centered education particular attention is paid to individual work with pupils, which is carried out in the form of individual lessons and consultations. Individual lessons can help children determine the topic of the research, methods and means of conducting research, etc. Individual consultations are held during students' work on the selected topic. It can include the consultations of scientists. Also, great attention is paid to independent work with scientific literature. Schoolchildren can use digital textbooks and manuals based on hypertext technology when they processing theoretical material. Students are expected to master the knowledge and to form the appropriate skills in classes of group study "Applied Software", according to the approved program [5] (Table 1).

Table 1

The List of knowledge and skills that schoolchildren acquire while attending Applied Software classes

Knowledge of	Skills
<ul style="list-style-type: none"> • modern information systems for processing the results of scientific research, software development tools, their main characteristics; • different methods of classifying modern software; • types of general-purpose software; • methods of using graphic, textual capabilities of modern software; • methods of using databases; • methods of using spreadsheets; • Internet security basics; • the requirements for conducting the research and the procedure for its implementation; • modern mathematical methods of processing of results of scientific researches, their classification and basic characteristics; • forms of generalization of the results of scientific research; • types of educational software; • types of pattern recognition systems; • types of text translation systems; • types of image processing software. 	<ul style="list-style-type: none"> • applying modern software (including software packages that support the modern mathematical apparatus) during scientific research, to analyze information systems, to select the necessary systems and tools for solving the problem of research results analysis; • using the graphical capabilities of modern software development tools to create drawings, graphics, and other graphic objects; • developing computer programs to handle complex calculations; • designing text documents of complex structure; • providing automatic execution of simple mathematical calculations in text documents; • creating automatic content and hyperlinks in a text document; • using all the features of modern software to create computing programs; • developing programs for processing complex calculations using spreadsheets; • using capabilities of databases, developing and designing methods of data input; • determining the purpose and objectives of the research; • carrying out a preliminary statement of the research problem, analyzing the methods and means of scientific research; • searching information in libraries and Internet resources; • developing computer programs to automate the research process; • working with special purpose software: Gimp, FineReader, MS Publisher, online translators, etc.; • developing the simplest educational software for educational purposes with Microsoft PowerPoint; • developing the simplest websites with the available free online designers; • using the graphical capabilities of modern software for different graphic objects, etc.

Conclusions and research perspectives. As a conclusion we assume that the group work gives an opportunity to take into account and develop the abilities and inclinations of students. This forms the most vivid advantages if the type of activity of a regular classes, thus, group

study works of computer science is always cross-curricular in nature because of the variety of possibilities and tools provided by computer including ICTs. A number of devices that are studied and used in group works, tasks of different complexity, the need for extensive theoretical and practical

knowledge allow through a thoughtful selection of topics, satisfy the interests of all members of the group, regardless of their knowledge, experience and abilities. As a result, students' research within a study group can be conducted in scientific conferences, debates, seminars, contests or other intellectual competitions where young scientists will present their research results and substantiate their work.

Thus, group work greatly contributes to the development of the creative personality of the schoolchildren, their self-realization precisely through the introduction of a person-centered approach. The involvement of gifted students to various

project-based activities within the group study work helps them to develop cooperation, interpersonal communication as well as to deepen knowledge and improve the acquired skills in both computer science and other subjects. Taking the world exploration and the cognitive processes to a completely new level with the help of computer-based technologies and newly-designed software helps students in the future to self-identify and professionally determine themselves. Therefore this field remains one of the most promising areas for childrens' educational development.

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