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Organizing Research Activities in General Education Using the Example of the Lyceum "ISTEK" / Особенности организации научно-исследовательской деятельности в общеобразовательном учреждении на примере НЧОУ «Лицей «ИСТЭК»

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Аннотация: В статье приведен теоретический анализ особенностей научно-исследовательской деятельности в общеобразовательном учреждении. Описана система научно-исследовательской деятельности Лицея «ИСТЭК». Предмет исследования: организация научно-исследовательской деятельности в НЧОУ «Лицей «ИСТЭК». Целью является усовершенствование системы научно-исследовательской деятельности в НЧОУ «Лицей «ИСТЭК». Приобщение обучающихся к научной деятельности является необходимым условием реализации Федерального государственного образовательного стандарта начального общего, основного общего и среднего общего образования (от 22.02.2024 г.). Это задает формирование познавательного интереса учебной

деятельности и готовность к саморазвитию и непрерывному образованию. Организация научно-исследовательской деятельности должна являться неотъемлемой частью образовательного процесса в школе. Научно-исследовательская деятельность способствует формированию у обучающихся общекультурных и научных ценностей, формирует систему предметных навыков и личностных качеств, которые соответствуют требованиям стандарта. В работе используются теоретические методы исследования (прогнозирование, сравнение, анализ понятий и терминов, анализ литературы) и эмпирические (наблюдение, тестирование, анкетирование). Проведено анкетирование обучающихся 7-11 классов с целью выявления преобладания познавательных мотивов обучения и как следствие, вовлечение в научно-исследовательскую деятельность. В ходе теоретического анализа литературы было выявлено, что научно-исследовательская деятельность определяется в современных исследованиях как условие личностного развития обучающегося, показатель индивидуальности, творческих способностей, готовности к самореализации и росту, она способствует развитию познавательных потребностей и интересов обучающихся; формирует мировоззрение; развивает творческие исследовательские умения; активизирует овладение знаниями; способствует развитию личности субъекта учения и т.д. Проведенное исследование доказало необходимость реализации системного подхода при организации научно-исследовательской деятельности в лицее «ИСТЭК». Основные преимущества системного подхода к организации научно-исследовательской деятельности в Лицее «ИСТЭК»: развитие интеллектуальных способностей обучающихся, формирование интереса к науке, подготовка к будущей профессиональной деятельности, развитие творческого потенциала обучающихся, успешность в будущем. Такой подход является важным элементом успешного обучения и способствует развитию личности обучающегося.

Ключевые слова:

научно-исследовательская деятельность, общеобразовательное учреждение, творческая деятельность, интеллектуальные способности, исследовательские умения, системный подход, поисковый интерес, познавательная активность, практические навыки, формы научно-исследовательской деятельности

Introduction

The intensification of creative activity of all strata of our society characterizes the modern world. That is why the problem of strengthening the development of the intellectual abilities of the younger generation in education is particularly acute. The fundamental requirement of society in a modern school is the formation of a person who can solve scientific, industrial, and social tasks creatively, think critically independently, and develop and defend his point of view [4]. This is due to the increasing flow of information that a person needs to master, navigate confidently, and be able to select and use the acquired knowledge and skills. **These tasks can only be addressed through schoolchildren's systematic and gradual involvement in research activities.**

The involvement of students in scientific activities is necessary for implementing the Federal State Educational Standard of primary general, introductory, and secondary general education (dated 02/22/2024). This sets the formation of cognitive interest in educational activities and readiness for self-development and continuing education. The organization of research activities should be an integral part of the educational process at school. Research

activities contribute to the formation of general cultural and scientific values among students, forming a system of subject skills and personal qualities that meet the standard's requirements.

A lot of attention is paid to organizing students' research activities. Research activities have been studied by V.V. Belonosova [1], V.P. Bespalko [2], G.E. Zhurakovsky, A.I. Piskunov, B.E. Raikov, A.I. Savenkov, A.V. Leontovich, I.A. Zimnaya, etc.

However, despite this, the new tasks set for the modern school determine the need for pedagogical research to improve the organization of research activities.

Thus, the *relevance of this study* is determined by the following contradictions:

– the need to organize research activities throughout school education and the lack of elaboration of the specifics of the content and forms of organization, allowing to realize its educational potential at different levels of education;

– the desire to promote the development of research competencies among schoolchildren and the lack of development of methodological support at school.

The purpose of the study: to improve the system of scientific research activities in NCHOU "Lyceum "ISTEK."

The subject of the study: the organization of research activities in NCHOU "Lyceum "ISTEK."

The methodological basis of the study was:

– a personality-oriented approach in education, where great importance is given to self-development, self-design, self-education, self-realization, and the development of individuality (E.V. Bondarevskaya, O.S. Gazman, V.V. Serikov, I.S. Yakimanova);

– a competence-based approach (V.I. Baidenko, I.A. Zimnaya, etc.) that consists of finding ways to ensure a personal-activity position in education.

The theoretical basis of the study was:

– works of teachers and psychologists reflecting the specifics of research and cognitive activity in individual and personal development (V.I. Andreev, A.G. Asmolov, L.I. Bozhovich, I.S. Ilyin, A.N. Leontiev, A.K. Markova, A.S. Obukhov, E.V. Tyaglova, A.V. Khutorskoy, G.I. Shchukina, etc.);

– research on the content and forms of organization of research activities (V.I. Andreev, I.V. Homan, G.S. Savenkov);

– works reflecting the principles of organizing research activities: N.G. Alekseev, P.Ya. Galperin, V.V. Davydov, A.V. Leontovich, I.Ya. Lerner, A.S. Obukhov, P.I. Pidkasisty, I.P. Podlasy.

To achieve this goal and solve problems, the following *research methods were used:*

– theoretical (forecasting, comparison, analysis of concepts and terms, and literature analysis);

– empirical (observation, testing, and questionnaire);

The scientific novelty of the research is as follows:

– as a result of a theoretical analysis of literature sources and based on empirical research, it was revealed that the most effective way to organize research activities is to use a systematic approach, which contributes to the active involvement of students in this activity.

The main part

The term "research activity" means a unique organization of the educational process or the attribution of research activities to one of the innovative modern educational technologies. This is a scientific activity related to scientific research, research experiments to expand existing and obtain new knowledge, test scientific hypotheses, establish patterns manifested in nature and society, scientific generalizations, and scientific justification of projects [Platonov]. With the help of research activities, an essential task of modern education is being solved: the development of students' independence when working with unique literature and scientific sources in the process of observing and performing experiments, training orientation skills in information flows, obtaining skills to pose a problem and analyzing possible ways to solve it [6].

The organization of students' research activities has its own characteristics. In his writings, V.I. Andreev notes the role of research activities in developing cognitive needs [7]. V.A. Dalinger considers it important to acquire theoretical knowledge and practical skills through scientific methods of cognition, which, in turn, is a means of developing creative abilities and research skills. K.A. Khalatyan believes that solving research problems contributes to developing a student's personality. A.I. Savenkov, speaking about research activity, calls it intellectual and creative, which is based on search activity [10]. A.V. Leontovich considers the solution of creative research activity to be the main characteristic of research activity tasks with unknown results in advance. A.S. Obukhov also notes that this creative process develops a research position and forms a worldview. I.A. Zimnaya characterizes research activity as a process of satisfying cognitive and intellectual needs [5].

What is common to all the proposed definitions is that they emphasize the importance of carrying out research activities: promotes the development of cognitive needs and interests of students, forms a worldview, develops creative research skills; activates knowledge acquisition, encourages the development of the personality of the subject of learning, etc.

The organization of research activities in an educational institution is based on the following principles:

– the principle of voluntariness;

– the principle of accessibility;

– the principle of problematicness;

– the principle of taking into account age and individual characteristics;

– the principle of consistency [8].

The student's willingness to research knowledge is determined precisely by curiosity and the need to overcome cognitive difficulties. The degree of activity, independence, and involvement in scientific research depends on a teenager's interests. Here, it is important to have a value attitude toward the knowledge gained, an interest not only in achieving the result but also in the very process of scientific research [3].

One primary motivation that encourages teenagers to conduct research is their orientation toward obtaining new knowledge.

That is why a questionnaire was conducted among students in grades 7–11 at the NCHOU Lyceum ISTEK to identify teaching motives. Appropriate methods were selected: the typology of teaching motives and the "Ladder of motives" (A.I. Bozhovich, I.K., Markova).

As you know, the desire of schoolchildren to learn depends on their availability:

– cognitive motives: the desire to understand how the world works, to master new skills, to master a profession;

– social motives: the desire to learn, earn praise and approval, and communicate with classmates.

Cognitive motives are embedded "inside" the educational activity, while social ones can be considered external. Internal and external learning motives can be divided into two poles: the child's interest in the activity itself and the interest in the activity caused by external reasons. For example, the child wants to be loved by parents, respected by their peers and likes to be first or the center of attention.

The number of subjects was 144 people. The sample included students aged 13–17 years.

The survey data is shown in the diagram (Figure 1).

Figure 1 – Diagnostic results using the "Ladder of motives" technique

According to the diagram results, 57% (82 people) of the surveyed adolescents have cognitive motives in learning. Here, most students put "I study to know things" in first place. The second most important choice was "I study to solve problems myself." These students have a more developed internal motivation, which is associated with the student's interest in educational activities. Some students, who generally have cognitive motives, put the social motive "I study to please my parents with my success" in first place. This may be due to the parents' demanding academic success.

In the course of the study, the predominance of cognitive motives by age is traced. The number of students with dominant cognitive motives increases in older adolescents. So, if in grades 7–9, it is 4–6 people, then in grades 10–11, it is 10–14 students. From grade 7 to 9, the results are approximately the same in each parallel. However, significant discrepancies are observed in grades 10-11. This is because ideas about their future determine their primary motives. The selectivity of cognitive motives is dictated precisely by the future choice of profession.

Next, let's look at the study's results on the scale of "social motives." As we can see, the social motives of teaching prevail in 19 out of 144 teenagers surveyed, which is 13%. Many teenagers replied that they study to please their parents. Equally important was the statement that they want to be useful to people. Even though the demands and criticality toward the teacher and his assessment are increasing in this age range, only one teenager out of the respondents notes their primary motive is for the teacher to be satisfied with their success. Also, one teenager replied that they study to be respected by their peers.

30% of adolescents (43 people) have a harmonious combination of cognitive and social learning motives. Two cognitive and two social motives occupy the first four places in the hierarchy of motives for these students. It should be noted that for most surveyed adolescents, the first two places are occupied by cognitive motives.

Thus, most respondents (57%) are dominated by cognitive motives for learning, which is a reasonable basis for engaging in research activities.

With 19 teenagers revealing the dominance of social motives for learning, there is still work to be done on developing internal learning motivation. First, attention should be paid to these students' success.

One of the main motivations for students to carry out research activities is their orientation toward obtaining new knowledge. The results of the research confirm this. A systematic approach can activate these motives.

The system of scientific research activities of the ISTEK Lyceum includes a set of measures aimed at developing the scientific potential of students:

1. **Participation in competitions and Olympiads**. This helps increase students' motivation for scientific activities and allows them to show their abilities and talents. Olympiads are one of the generally recognized forms of working with gifted children. Starting from the first grade, Lyceum students take an active part in rating competitions and Olympiads, which contribute to the development of interest in the subjects studied, stimulate creative activity, initiative, and independence of students, and help students form their own unique creative world. The number of participants in the All-Russian Olympiad of Schoolchildren has increased significantly. Every fifth participant becomes a prize-winner or a winner, which allows them to enroll in leading universities in Russia.

2. **Organization of conferences and seminars**. One of the traditional events is Science Week, in which Lyceum students meet with scientists, present their scientific research for defense, participate in master classes, and visit scientific laboratories.

3. **Scientific circles and sections** allow students to engage in research and experiments under the guidance of experienced mentors. This approach helps students demonstrate their abilities and interests in science and develop independent work and information analysis skills. The Lyceum has clubs of various kinds: the Workshop of Sciences, the Medical and Biological School, Cryptography, Smart Technologies, and Artificial Intelligence.

4. Cooperation with scientific organizations and universities provides students access to modern scientific laboratories, equipment, and resources and promotes the development of career guidance.

5. **Project activities**. Lyceum students from the first to the eleventh grade, under the guidance of scientific supervisors, carry out and defend individual and group projects. This

activity involves the active development and use of theoretical and empirical methods of scientific cognition, focused on the formation of students' research competencies.

6 . **Lyceum Academy of Sciences (LAN)** It is headed by a presidium that includes scientists, teachers, and students with research achievements. The LAN's structural divisions are subject methodological associations that form temporary research teams (VNIK).

7. Summer subject schools offer programs in various fields of knowledge, such as foreign languages, business, journalism, medicine, engineering, physics, and mathematics. In the classroom, students apply their knowledge in practice. This can involve working on real projects, participating in master classes, or conducting research.

8 . **Encouragement of scientific achievements**. This is an incentive for students and is carried out through awards, grants, and other forms of recognition. This approach motivates lyceum students to continue engaging in scientific activities and developing their abilities.

Thus, it is possible to identify the main advantages of a systematic approach to the organization of research activities at ISTEK Lyceum:

– development of students' intellectual abilities

– formation of interest in science

– preparation for future professional activity

– development of students' creative potential

– success in the future

Conclusion

The theoretical analysis of the literature revealed that research activity is defined in modern research as a condition for a student's personal development, an indicator of individuality, creativity, readiness for self-realization, and growth. It contributes to developing students' cognitive needs and interests, forms a worldview, develops creative research skills, activates knowledge acquisition, promotes the development of the subject's personality, etc.

The research proved the need for a systematic approach to organizing research activities at the ISTEK Lyceum. This approach allows students to gain the necessary knowledge and skills and to showcase their abilities and talents in the scientific field. It is an essential element of successful learning and contributes to developing the student's personality.

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Результаты процедуры рецензирования статьи

В связи с политикой двойного слепого рецензирования личность рецензента не раскрывается.
Со списком рецензентов издательства можно ознакомиться здесь.

Актуальность исследования продиктована пониманием важности привития навыков исследовательской деятельности на этапе общего образования, поскольку именно в его рамках обычно проявляются способности обучающихся к творчеству, в том числе и к научному.
С точки зрения методологии работа имеет сугубо практический характер. Основным методом исследования выступает эксперимент, реализованный на диагностическом этапе, что выступает минимальным и достаточным инструментарием для статьи подобного рода.
Работа выполнена в соответствии с нормами научного стиля, список литературы с содержательной точки зрения соответствует требованиям и находит отражение на страницах статьи. Цитаты оформлены в целом корректно.
Исследование может вызвать потенциальный интерес у весьма широкой аудитории педагогов-практиков, а его теоретическая часть может стать основой для выпускных квалификационных работ.
По работе существует ряд замечаний.
Формальное. В списке литературы только один относительно современный источник (2016), многие источники относятся к позапрошлому десятилетию и нет ресурсов десятилетия нынешнего, уже истекшего почти на половину. Тем более это странно для работы, посвященной исследовательской деятельности, предполагающей инновационность.
Содержательные. На наш взгляд, актуальность и новизна данной работы чрезвычайно локальны и сводятся фактически к обмену опытом, в чём ее несомненная практическая значимость. Мы бы поспорили с обозначенным в порядке противоречия недостатком исследования организации исследовательской деятельности обучающихся. На наш взгляд, даже невооружённым глазом видно, что спектр работ, начиная от фундаментальных теорий развивающего обучения, заканчивая методическими разработками по проблемному, проектному и т.п. обучению весьма широк.
Обозначенная новизна как понимание эффективности системного подхода является, на наш взгляд, формальной, поскольку педагогический процесс системен по природе, ввиду чего системность есть его ключевая характеристика на всех уровнях, что аксиоматично с точки зрения педагогической теории.

Теоретическая часть выполнена в большей степени на методическом, нежели на содержательном уровне. Так в обзоре авторов отсутствует описание их конкретного вклада, основных тезисов, определений, значимости их исследований в разработку темы и т.п..

При описании принципов отсутствует информация о том, каковы конкретные механизмы их реализации, проявления и т.п. в рамках исследуемого процесса.

Указанные замечания позволяют говорить о том, что рукопись имеет характер методической (в лучшем случае научно-методической) разработки, но не научно-аналитической статьи. С учётом хорошего качества, тщательности и аккуратности в исполнении текста, мы полагаем, что она может быть опубликована в практической рубрике рецензируемого педагогического журнала в случае, если политика издания предполагает публикацию методических материалов.