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4. Kutsenko, T. V. (Comp.). (2016) *Metodychni rekomendatsii do vprovadzhennia pedahohichnykh umov profesiinoi samorealizatsii vchyteliv u systemi metodychnoi roboty zahalnoosvitnykh navchalnykh zakladiv dlia dyrektoriv, metodystiv, uchyteliv, slukhachiv Instytutu pidvyshchennia kvalifikatsii, perepidhotovky*. Kharkiv, Ukraine.

5. Rybalko, L. S. & Kutsenko, T. V. (2016). Profesiina samorealizatsiia uchyteliv zahalnoosvitnykh navchalnykh zakladiv v umovakh suchasnykh vyklykiv (akmeolohichni aspekt). *Suchasni akmeolohichni doslidzhennia : teoretyko-metodolohichni ta prykladni aspekty*. Kyiv, Ukraine.

6. Rybalko, L. S. (2016). Portfolio as a means of self-education activity of a teacher of a general education school. *Suchasna pedahohika ta psykhohohiia: vid teorii do praktyky*. Abstracts of Papers: '16: *Vseukrainska naukovo-praktychna konferentsia*. (pp. 80-83). Zaporizhzhia, Ukraine.

7. Rybalko, L. S., Chernovol-Tkachenko, R. I. & Kutsenko, T. V. *Acmeological principles of professional self-realization of teachers in the system of methodical work of general educational institutions*. Kharkiv, Ukraine: Biblioteka zhurnalu «Upravlinnia shkoloiu», 7.

8. Chernovol-Tkachenko, R. I. (2013). Management Techniques. *Komunikatsii v navchalnomu zakladi. Serii «Abetka kerivnyka»*, (2), 78–139.

3.16. ORGANISATION OF SENIOR PUPILS' INDEPENDENT COGNITIVE- CREATIVE WORK IN HEURISTIC-MODULE EDUCATION

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Abstract. *The scientific validity of the didactic conditions for optimum organization of senior pupils' independent cognitive-creative work has included: use of innovative opportunities of training module (its integrity, completeness, priority of motivated independent work, etc.); consideration of the specific features of creative activity in general and providing creative interaction between subjects of learning and their assimilation of the mechanisms of heuristic and creative activity; providing competent pedagogical diagnostics on the basis of detailed levels, which are understandable for pupils, and the criteria of educational achievements. Being realized in pedagogical experiment, these conditions have provided productive improvement of heuristic-modular educational technology, assisted essential increase of a level of cognitive-creative activity and independence of senior pupils, appreciable improvement of quality of external and internal creative products as main parameter of progress of performance of pupils' independent work and important factor of motivation of active training.*

Key words: *training module, independent cognitive-creative work, heuristic-modular education, cognitive-creative self-reliance, pedagogical diagnostics, levels and criteria of achievements, mechanisms of creative activity, creative product.*

The National Doctrine of Education Development in the 21st Century has declared that the aim of state policy of education in Ukraine is providing the conditions for creative self-realization of all citizens, for education of people who are

able to work effectively and study throughout life. The reformation of modern school education is aimed at introducing the conceptual principles that promote the creation of psychological comfort and development of children's creativity as their primary needs. This idea is revealed in "The Concept of Reform of Institutions of Secondary Education" (2016) where it has been stated that "the key competencies and cross-cutting skills create "canvas" which is the basis for the successful self-realization of a pupil as an individual, citizen and expert" [1]. Among the core competencies that must be formed in pupils, an important place belongs to the ability to develop and generate independently new knowledge, ideas and initiatives, to implement them into life, ability to think critically, make independent decisions, solve significant problems and more complex tasks. This requires innovative organization of independent activity of students, in particularly senior pupils.

Traditional education (reproductive, anti-dialogue, poorly motivated) is changed to innovative education with its creative dialogue of all participants, with the priorities of active and productive independent activity of students [2]. Nowadays, in the content and organizational spheres of the educational process, we pay great attention not only to the interaction between teachers and students but also the quality of such interaction: skilful organization and stimulation of active educational and cognitive activities, particularly students' independent work. According to the opinion of some educators (A. Aleksiuk, I. Kharlamov, V. Kurylo, V. Lozova, V. Okon, V. Onischuk, V. Palamarchuk etc.), an active and constructive interaction (both direct and indirect) between teachers and pupils is decisive thing while revealing the essence of modern students' education and its epicentre – pupils' independent creative activity.

One of the innovations in this aspect was the theoretical development and technological introduction of heuristic education (V. Andreiev, A. Korol, B. Korotiaiev, A. Hutorskoy) and module education (M. Choshanov, A. Furman, P. Sikorskiy, P. Tretiakov). Over the past decade, the interaction of these concepts and technologies has occurred, and in the unity they have made a system of heuristic and module education that was spread in secondary and high school. The conceptual ideas of the heuristic education assert the priorities of pupils' independent cognitive-creative activity as the main part of educational process and the leading factor of creative self-realization of a person according to the purpose of national education. And this self-realization is very clear and intuitive for children and teenagers: it's the educational product, which is created by their efforts, – an essay, project, story, generalized scheme, model, solved mathematical problem or a fantastic tale. The main thing for it is to be meaningful for an author and to be the result of his heuristic efforts such as searching, designing and creating [3]. Heuristic education and its technologies help to develop independence and initiative of pupils, especially senior pupils who already have prognostic and constructive thinking, and that is why they have internal motives for their use.

According to the researchers' views, module education disciplines and structures the different kinds of cognitive activities, including heuristic activity. It requires completeness of educational steps, objective and timely diagnostics of

their results, first of all the products of independent cognitive-creative work. At the same time, the latest ideas and technologies of students' independent creative activity and modern developments devoted to the objective and convenient (for teachers and students) diagnostics of created educational products have not been revealed in the concepts of heuristic and module education. The peculiarities of organization of creative independent work in module, heuristic and module-heuristic technologies have not been depicted in the published theoretical and methodological works. The pedagogical conditions of their organization using the powerful features of integrated module-heuristic approach to pupils' cognitive-creative activity have not been outlined yet.

The purpose of the article is to reveal the results of the experimental testing of the model and pedagogical conditions of organization of independent cognitive-creative works in senior pupils' heuristic and module education.

Methods of the research. A complex of methods has been used for this study. They are: theoretical analysis and generalization of scientific and methodological literature to identify the essence and content of heuristic-module education, pupils' independent heuristic activity; methods of theoretical and practical forecasting and modelling to create innovative models and technologies of senior pupils' creative independent work and appropriate pedagogical conditions of their organization; methods of complex pedagogical diagnostics to evaluate the effectiveness of modular (completed) creative independent work; pedagogical experiment to test the suggested hypothesis; methods of statistical processing of the obtained results to establish the reliability of the findings of the research.

Heuristic-module education is practically implemented through the integration of heuristic and module technologies of cognitive activity where a leading place belongs to pupils' creative independent work. On the basis of the analysis of didactic opportunities and problems of heuristic-module technologies, a modified model of heuristic-module education, where the organization of creative independent work takes priority, has been created and practically applied in the experiment. The mentioned model includes the following components of the cognitive creative interaction between teachers and pupils: incentive motivational component, component of the primary assimilation of theoretical material, self-dependent heuristic-search work on understanding and deepening of new theoretical knowledge, completed independent information-descriptive, heuristic-search and constructive work, systematization and generalization of leading knowledge and skills, ways of creative activity, final independent heuristic work of information-explanatory, constructive or creative level, correction.

Incentive motivational component means that senior pupils do not only perceive teacher's motivational and target explanations, but they also independently construct own motives, personal goal and tasks of the work within determined training module.

The component of the *primary assimilation of theoretical material* means that during lectures or school teacher's explanation pupils try individually or in determined interactive groups not only to understand the essence and structure of theoretical knowledge, but they also (through a variety of mechanisms of heuristic activity) learn to reformulate the main concepts, interpretation of laws, generalizations according to

pupils' understanding of them, to formulate the problem, heuristic questions etc.

Self-dependent heuristic-search work on understanding and deepening of new theoretical knowledge means that students apply to specific sources to answer (orally or in writing) specific problematic questions that were clarified by a teacher and classmates at the preliminary stage with the aim of improving the acquired theoretical knowledge.

A completed independent information-descriptive, heuristic-search and constructive work aims at formation of heuristic ways of activity, development of cognitive and reflexive skills and abilities (heuristic-module technology provides more time for pupils' independent practical activity).

Systematization and generalization of leading knowledge and skills, ways of creative activity includes such independent works as writing short scientific abstracts, generalizing diagrams, tables, graphs, algorithms, etc.

Final independent heuristic work of information-explanatory, constructive or creative level (at pupil's choice) means the creation of a personally significant creative product – an essay, story, applied project, experimental model, devise, independently formulated tasks, tests, reviews, etc. The quality of this product becomes crucial in diagnosing and assessing the acquisition of knowledge of a training module.

Correction (at pupil's request) of the final creative work is performed in order to improve it and obtain a higher grade [4].

The leading didactic conditions for organization of creative independent work in heuristic-module education have been substantiated in the study. These conditions influence the development of senior pupils' independent cognitive-creative activity and are summarized in Table 1.

The use of innovative opportunities of training module and heuristic-module technologies as a pedagogical condition includes, primarily, the implementation of the determined stages of a training module in the direct organization of creative independent work. The stages are: motivational-setting, instructive-criterial, operational, diagnostic-evaluative. Thus, each independent work had a clear structure, elements of cognitive-creative interaction of subjects of education and was technologically executed as a completed training module.

At the motivational-setting stage pupils learned to understand clearly the purpose and the main lines of independent work, a concrete plan of their actions. It means that they learned to work on the basis of goal-setting, purposefulness and prospects for success. In this way, a teacher organized interaction with pupils so that they could imagine and predict their own product (in external and internal form). Taking this in mind, a teacher persistently and constantly revealed the attractiveness of future work, formed orientation for success, showed possible actions to overcome the contradictions that were hidden in an educational problem, convinced that there is no need to fear mistakes, because they are ultimately a step towards success.

Table 1

Leading Pedagogical Conditions for Organization of Creative Independent Works in Heuristic-Module Education

Name of the pedagogical condition	Essence of the pedagogical condition	Conditions of implementation of it	Expected qualitative characteristics of creative work in the training module
1. Use of innovative opportunities of training module	Implementation of a set of positive characteristics of a training module for creative tasks	Redistributing of training time in favour of pupils' independent activity; implementation of completed and flexible heuristic-module technologies in the process of performing creative work and improvement of it	Achieving the completeness of motivational, operational, reflexive components of a work, the overall success of creative product, the possibility of further improvement of it
2. Consideration of the specific features of different types of heuristic activity (search, reconstructive, constructive, creative), providing creative interaction of its subjects	Achieving the conformity of pupils' individual actions with the specificity of heuristic activity, mastering the experience of such activity within the framework of the completed technology of a module	Introduction of mechanisms of creative activity (forming and reflexive), providing pupils with possibilities of prolonged deepening in creative process, ensuring the interaction of subjects of learning as unity of help and counteraction	Mastering methods and mechanisms of creative activity, skills of self-realization, prognostication and creation of original products
3. Providing competent diagnostics and correctional activity of a teacher and pupils	Providing positive motivation, development of pupils' skills and abilities to diagnose and evaluate the results of their own independent work, to correct further activity	Introduction of a set of diagnostic techniques for monitoring reconstructive, constructive and creative work, training pupils for work on diagnostic-criterial basis	High and sufficient levels of criteria and indicators of creative tasks of different kinds, capability of using them to evaluate and correct objectively the quality of educational product

At the *instructive-criterial stage*, pupils received not only general instructions for the tasks but also clearly focused on specific criteria of quality of a certain type of creative independent work, which helped pupils to choose the appropriate ways to solve a creative task and to predict the results of the activity.

The implementation of the *operational stage* provided, on the one hand,

the organization of pupil's full and prolonged deepening in individual creative process, and, on the other hand, his timely interaction with a teacher and group-mates after completing some of the current tasks on clarifying his own goal and educational steps. At this stage, the active use of methods of collision of contradictions, prognostication of their solution, making alternative assumptions, construction, proving, disproving and generalization was ensured.

At the *diagnostic-evaluative stage*, using the detailed criteria of quality of performing certain type of creative independent work and diagnostic techniques, each pupil was able to find defects and errors, identify their causes and ways to overcome and on this basis, evaluate the work and improve the quality of his educational product.

In order to do this, *the levels, criteria and indicators of senior pupils' cognitive-creative independence* during the performance of independent works of creative nature, as well as an invariant model of organization of senior pupils' reconstructive, constructive and creative independent work under the determined conditions of heuristic-module training were developed.

The developed and experimentally verified criteria of cognitive-creative independence correspond to the main characteristics – components of creative activity (motivational, operational, communicative and diagnostic), and pedagogical conditions for organization of pupils' independent activities were aimed at providing them.

When implementing such a condition in organization of independent work as consideration of the specific features of cognitive-creative activity, in order to achieve pupils' proper creative independence, the experiment was provided with detailed developments for each type of creative work, recommendations to teacher and pupils regarding a high (creative), sufficient (constructive), executive-reconstructive levels of cognitive-creative independence and detailed criteria and indicators corresponding to them.

Real creativity is impossible without use of special techniques of heuristic activity, so the experiment included pupils' mastering *the mechanisms of cognitive-creative activity*, such as search for unknown with by *analysis through synthesis, heuristic methods (heuristics)*, solving problems through interaction of intuitive and logic methods etc. These mechanisms concerned both operational and diagnostic-evaluative stages of activity.

The study proved experimentally the necessity of such condition as *providing competent diagnostics and correctional activity of a teacher and pupils*. It was proved that *the core of the diagnostics is identification of the objective causes of mistakes, drawbacks and difficulties according to the criteria of quality of independent work* (they were formulated and assimilated by pupils) and necessary ways to achieve them.

Special attention was paid to the procedures of *self-diagnostics* and *self-evaluation* of a performed work on the basis of it. They became the most important stage not only when the individual attempts have been completed but also when positive educational motivation has been supported [4].

Applying the criteria approach to the diagnostic procedures, the pupils were taught to realize and transform mentally the essential criteria of quality of the

done work according to the levels of educational achievements, which in general became the guidelines of diagnostics and evaluation in the educational process.

Expert assessments of efficiency of organization of creative independent works in heuristic-module education were carried out by determining the level of cognitive-creative independence, achieved by the senior pupils (*operative-reconstructive, constructive or creative levels*). For each of these levels, a set of necessary and sufficient quality criteria that help both a teacher and a pupil to evaluate the results of cognitive-creative attempts has been tested for the first time.

The experiment allowed to conclude that the suggested organization of independent work led to the essential positive changes – the growth of senior pupils' cognitive-creative independence. It was proved by the generalized results of some creative works within the framework of a training module and dynamic changes of main indicators of senior pupils' cognitive-creative independence, as they were found out by the experts (teachers, methodists, scientists) due to the complex analysis of different creative works (according to the stated criteria).

Abstracts, annotations, compositions, reviews etc., fulfilled at the constructive or creative levels under conditions of achieving completeness with the help of different factors of heuristic-module education (more time, interpersonal consulting, absence of obligatory and ultimate mark, providing possibilities for profound diagnostics and correction of the fulfilled work) caused increasing interest and activity in most pupils and their desire to improve the results of their attempts. Thus, organizational, psychological and didactical factors of heuristic-module education objectively created the new favourable conditions for pupils' independent work, gradually increased its productivity and quality. In its turn, a dynamic process of fulfilment of creative independent works objectively improved the organizational structure and content of the educational process.

The results of expert assessments according to the criteria of educational achievements in performance of creative works indicate the feasibility of the suggested transformation towards more thorough and comprehensive provision of pedagogical conditions for pupils' creative work. Due to these conditions, in the experimental forms the essential growth of creative achievements in independent work has been attained in two academic years. The amount of works, that were evaluated by the experts as works of the reproductive level and have low creative characteristics, has been reduced almost three times. At the same time, the amount of works, that were evaluated by the experts as works of the constructive level, has been increased by almost 1,5 times (from 36 to 52%). The amount of works of the creative level has been increased by more than 2 times (from 14 to 32%). The similar results in the control forms have been much inferior to the indicators of the experimental forms and cannot be regarded as essential progress in the dynamics of pupil's cognitive-creative independence.

So, the experiment has proved the innovative opportunities and unused reserves of the heuristic-module education.

Conclusions. So, the model and the pedagogical conditions for optimal organization of senior pupils' creative independent works in heuristic-module education have been scientifically substantiated. The conditions are: 1) use of innovative opportunities of training module, as they extends time and organizational

frameworks for pupils' successful creative activity and provide the integrity and completeness of it; 2) consideration of the specific features of creative activity in general and, in particular, providing creative interaction between subjects of learning as unity of help and counteraction, which can be optimally implemented in the new model of heuristic-module education; 3) providing competent diagnostic activity of a teacher and pupils as unchangeable factor of development of their creative activity and independence when using detailed quality criteria and introducing the mechanisms of their application. The technology of realization of the determined conditions for organization of constructive and creative independent works in senior pupils' heuristic-module education has been developed and experimentally tested.

The comparative analysis of achievements of the experimental and control forms testifies about the significant advantages of experimental organization of heuristic independent works of reconstructive, constructive and creative nature, their evident influence on the development of creative potential, senior pupils' cognitive-creative independence, their main competences – motives, abilities and skills.

Prospects for further research. The conducted experimental study does not solve the stated problem completely. The perspective aspects of further experimental work can be: further improvement of existing models and technologies of heuristic-module education, development of the theory and methods of different kinds of heuristic independent work in senior and high school, further profound theoretic-experimental development of different kinds of heuristic activity of teachers, pupils and students.

Література

1. Концепція Нової Української школи (2016) Режим доступу: <https://www.kmu.gov.ua/storage/app/media/reforms/ukrainska-shkola-compressed.pdf>.
2. Лазарева К. С. (2012) Спроможність ставити запитання – важливий показник пізнавально-творчого розвитку школярів. *Постметодика*. – Полтава: ПОІППО: Тов. «АСМІ» – № 2 (105), С. 36 – 41.
3. Лазарєв М.О. (2016) Педагогічна творчість. – Суми: ФОП Цьома С.П.
4. Лазарева О.М. (2013) Самостійна творча діяльність як провідний чинник самореалізації креативного потенціалу особистості. *Професійно-творча самореалізація майбутнього педагога в інноваційній освіті*. – Суми: СумДПУ, С. 262–287.

Bibliography

1. Kontsepsiya Nova Ukrainska shkola. (2016). Retrieved from <https://www.kmu.gov.ua/storage/app/media/reforms/ukrainska-shkola-compressed.pdf>.
2. Lazareva, K. S. (2012). Inquiring ability as an important indicator of the cognitive and creative development of schoolchildren. *Postmetodika*, 2 (105), 36 – 41. Poltava, Ukraine: POÍPPO: Tov. "ASMI".
3. Lazarev, M.O. (2016) *Pedagogical creativity*. Sumy, Ukraine: FOP TS'oma S.P.
4. Lazareva, O.M. (2013) Independent creative activity as a leading factor in the self-realization of the creative potential of the individual. *Profesiyno-tvorcha*

3.17. ORGANIZATION OF COMMUNICATIVE INTERACTION BETWEEN SUBJECTS OF EDUCATIONAL PROCESS IN HIGHER EDUCATION INSTITUTIONS VIA QR-CODES

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Abstract. *The article considers the communicative interaction between the teacher and students as a dynamic process which involves the transmission and understanding the educational information between subjects. The ways of organizing communicative interaction are determined with the help of information and communication technologies in the process of teaching students of the general and humanitarian nature by providing convenient and easy access to educational information; providing feedback between participants of the educational process; online training activities support. The use of QR-codes as an integration tool has been analyzed and the access to educational information between the teacher and students was provided. Learning objectives using QR-codes are presented: quoted beginning of the question, color option, onlineworking with historic text, clue code, secret message.*

Key words: *information and communication technologies, communicative interaction, communication, communicative channel, QR-codes, feedback.*

Relevance of the study the organization of communicative interaction between the teacher and students via QR-codes is based on the fact that this method of information and communication technologies is convenient and available channel for transferring educational information to all participants in the educational process. Considering the didactic potential of QR-codes offers broad prospects in education, in particular for improving communicative interaction in the class.

Recent publications analysis has showed high priority by the domestic scientists to the issue of communicative interaction between participants in the educational process. Considering various ways of its organization, researchers [1-4] agree that the educational process effectiveness depends on involvement of its subjects.

According to G. Moskalyk [1] the organization of pedagogical interaction depends on the achievement of desired results, the comfort of pedagogical process. To create a situation of interaction is necessary: an active inclusion of all participants of an educational process in the discussion and implementation of actions for making decisions on different stages of the organization of interaction; receiving constant feedback; research position of all subjects of an educational process; partnership of training participants. S. Ridkozubova [2] emphasizes that the organization of pedagogical communicative interaction is one of the conditions for improving the quality of students' professional training. Analyzing an own experience of communicative interaction organization with foreign students, the researcher draws attention to the use of interactive teaching methods in the