

## Formation of Independent Works in The Methodology of Teaching Biology on The Principle of "Heard-seen-done"

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### *Abstract:*

the article highlights the methodology of the formation of independent learning of students based on the principle of "heard-seen-done" innovative pedagogical educational cluster, an extensive analysis of the cluster approach and its specifics in modern methods of teaching biology.

**Key words:** biology, natural sciences, the principle of "heard-saw-done", pedagogical educational cluster, biology teaching, teaching methods.

### *Introduction*

Today, systematic thinking in pedagogical activity exceeds the acquisition of ordinary knowledge and some professional qualities. The main advantage of highly progressive states is determined by the state of the educational system, the presence of opportunities for the development of personality. After all, the factors that ensure the sustainable growth of a developed state in perspective depend precisely on how the educational sphere is organized [3]. Therefore, the creation and development of a new system of continuing education aimed at obtaining a worthy place in the world in the field of education was set as a priority. The strategy of research on the development of professional competence of pedagogical personnel of higher educational institutions is aimed at improving the development of professional competence of personnel on the basis of competency approaches, scientific and practical solution of the issues of individualization of forms and methods of development of professional competence, aimed at innovative activities.

In order to establish an effective system of training of highly qualified specialists with the skills of training competitive personnel for the field of pedagogical education, improving the quality of education, introducing advanced educational technologies into the field, applying modern knowledge and pedagogical technologies, Chirchiq experience was established [1]. The cluster approach in the development of education is considered as the main solutions for the development of education, in this regard, the private principle of the pedagogical educational cluster is considered effective in teaching Natural Sciences.

The scientific and educational principles of pedagogical higher educational institutions within the framework of the cluster include:

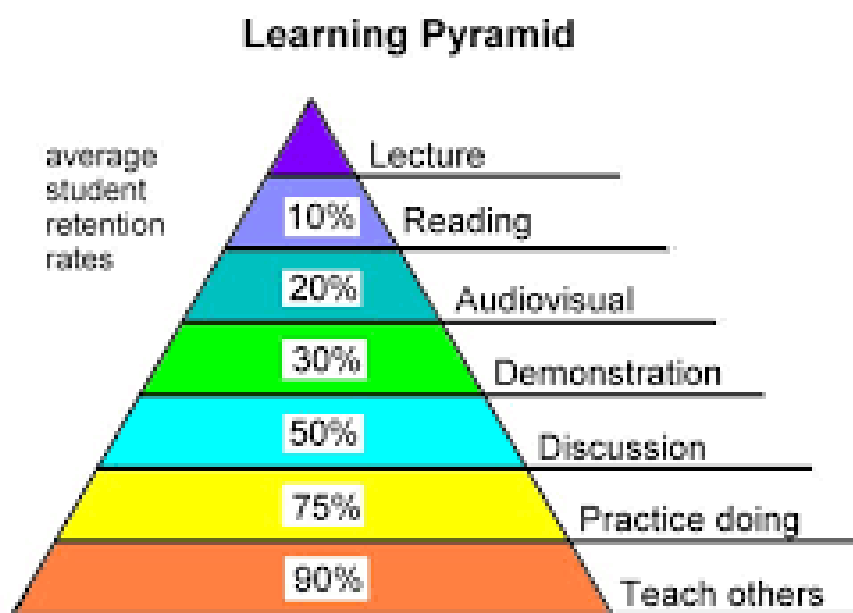
- \* concentration of educational, scientific and innovative processes together with the economy and social sphere, strengthening continuity, continuity and integration of educational processes;
- \* ensuring the integration of Education, Science and production,

\* application of effective innovation to education management;

•it consists of the integration of organizational, educational, methodological, scientific and informational tools.

In addition to the general goals of each principle, hususiy has goals aimed at the development of a specific field network, in order to develop the methodology of teaching Natural Sciences of the innovative cluster of pedagogical education, the principle of the educational cluster “heard-saw-done” was put forward.

The principle in question follows the “pyramid of Education”, which shows the recall of knowledge in the pyramid of Edgar Dale, and the main stage – “I have done” – corresponds to the appearance of Independent Education (Figure 1). In this case, the knowledge given to students will be independently applied to practice as a result of the knowledge, skills and competencies heard and seen, and the knowledge will have a high ability to be remembered and re-introduced into practice.



Source: National Training Laboratories, Bethel, Maine

**Figure. The pyramid of Education.**

In the organization of Independent Education of students:

1. formation of knowledge, skills and qualifications in students.
2. Instill in students a worldview, confidence and beliefs.
3. to increase the opportunity of students to create freely through independent education.
4. Enriching and nurturing student morale.
5. It is intended to open and grow the inner capabilities, abilities and talents of young people.

Analysis of thematic literature. Professor M.Porter of Harvard Business School to implement a cluster approach to education, explains the reason is that the mechanism of cluster formation is the concentration of directly related areas that cause an increase in mutual competitiveness[11]. And in the educational system of Uzbekistan, the founder’s of the formation of the innovation cluster of pedagogical education G'.I.Mukhamedov[3], U.N.Khodzhamkulov[4], Sh.I.Botirova, their scientific work, have studied extensively the theoretical aspects of the implementation in the educational and educational process.

In the teaching of Natural Sciences, it is much more effective to design lessons on the principle of pedagogical education, and the main focus and result are manifested on the basis of the completed stage. In this case, the students ' initial knowledge of the subject of science is determined through test questions.

The results of the scientific research are applied in the form of a monograph and a teaching and methodological manual. A.K. Rakhimov [10], N.A. Mirzaeva [7], D.B. Saidova [5] is reflected in her work.

The research carried out at the faculty is also reflected in the work of the master. In this regard Sh. Rozmatova, young educators such as Ergasheva are conducting scientific research work based on the principle of a cluster approach.

### **RESEARCH METHODOLOGY.**

The introduction of innovative clusters of pedagogical education, which form skills such as improving the content and quality of Education, Activity and willpower in future educators, leadership, consciousness and self-awareness, independent thinking, decision-making, methods of education and training, information and communication technologies, training of highly qualified professional pedagogical personnel devoted to their profession with the skills of applying modern pedagogical technologies

The most advanced peculiarities in the developed state educational system of the world can be absorbed into the principle of "I heard I fulfilled" and reflected in the national image. In this case, the "chirping model of education" applies to a cluster approach based on benchmarking of the educational development strategies of states with their own priority educational principles and directions in the world.

Pedagogical education innovation cluster is based on the principle of "Heard – saw – done":

1. Methodical assistance to secondary schools (teaching Natural Sciences) of the higher educational institution, improving the quality of education, continuous professional development of teachers;

2. Development of skills to increase the reach of higher education by organizing the "continuous professional education electronic platform" and directing graduates to the profession, effectively organizing classes and educational process on the basis of innovative pedagogical technologies;

3. Conducting scientific research work on integration, innovation, continuity, consistency, effective succession in the field of pedagogical education;

4. Organization of experience-testing processes of science-based innovation projects, creation of the opportunity to quickly reconnect with preschool, secondary education and OSM as well as other applicants in the training of pedagogical personnel;

5. Integration of intellectual resources around current issues of the development of pedagogical education;

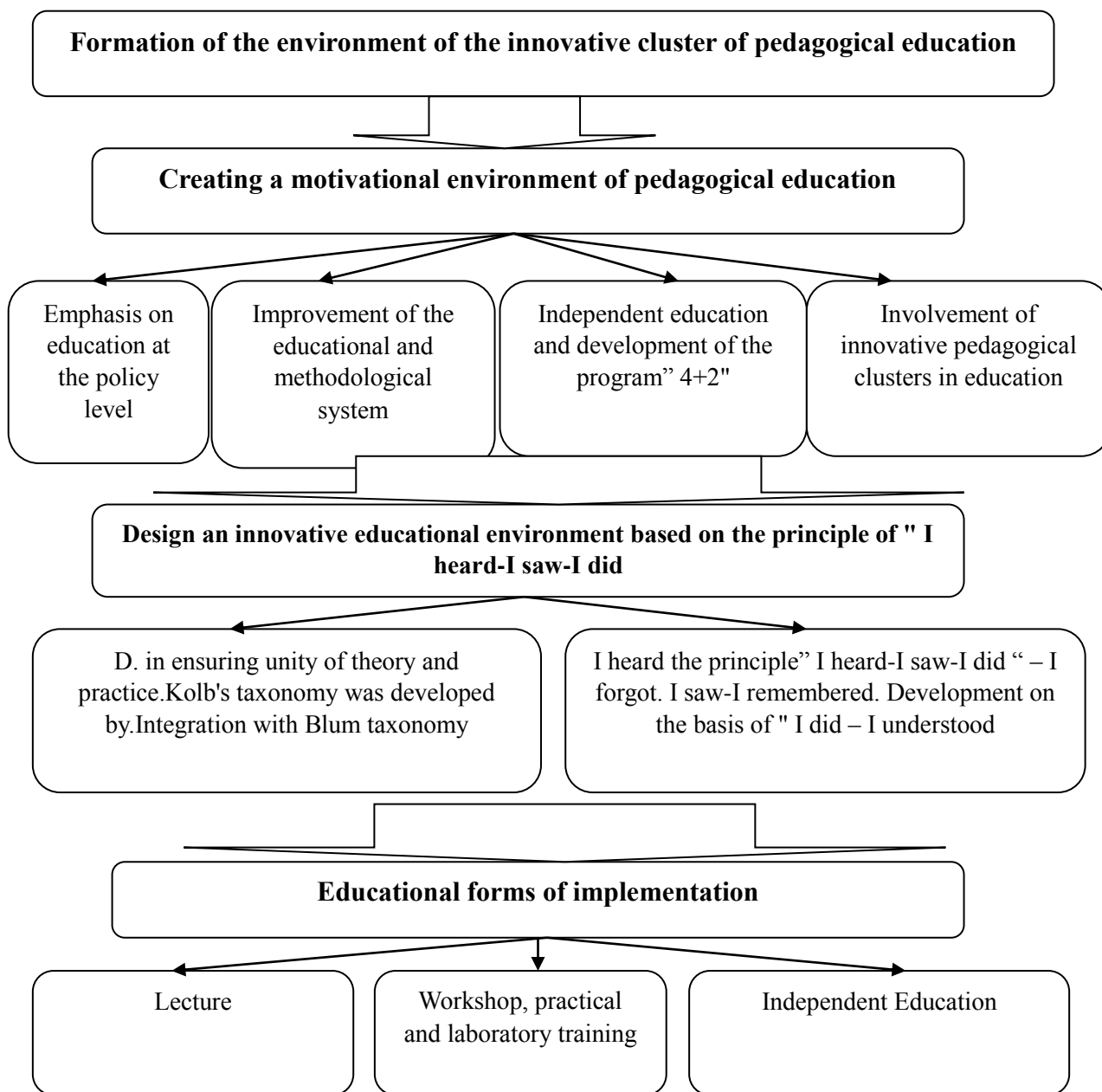
The purpose of the pedagogical educational cluster in the development of educational efficiency: it is developed on the basis of SMART technology. It will be aimed at creating results that will be able to perform a specified task, accurate and dimensional over a certain period of time. In the implementation of the principle, SMART-technology has its own definition, in which S-is based on the presence of specific targeted actions, tasks, m-on the basis of a clear and certain methodology of ways to achieve the specified goal, A-based on the presence of experiments in the field of Science in the implementation of the principle in

The structure (model) of the road map of the innovative pedagogical project "I heard-I saw-I did" - is considered the basis of the effective organization and implementation of the educational process. The implementation of the project includes psychological-pedagogical, socio-pedagogical and methodological work.

The purpose of the E-K-B principle is: to create results capable of performing a specified task, accurate and dimensional, at a given time interval. A clearly defined goal is the guarantee that the

task will be completed perfectly and efficiently. In this, the three foundations of the principle are considered leading.

In the process of teaching natural sciences, according to the principle “I heard-saw-I did”, it is carried out in the organization of classes: on the basis of forms, tools and methods of teaching. In this case, teaching methods based on the credit module system are listed as priorities.



**Figure 2. Formation of the environment of the cluster of pedagogical education in the teaching of Natural Sciences**

Educational innovation is associated with the achievement of qualitative changes through the systematic application of new forms and methods, approaches and technological processes aimed at solving problems related to the educational system based on the principle of development, in which the innovative cluster of pedagogical education is considered the main solution in solving problems in the field of education and education. The Cluster Development Chirchik model of continuous pedagogical education was proposed in order to eliminate the shortcomings associated with modern

requirements related to the high social significance of pedagogical education in the sustainable development of society, problems in the system and the lack of mutual cohesion between the Educational, Scientific and productive branches in solving them.

The purpose of the E-K-B principle is: to create results capable of performing a specified task, accurate and dimensional, at a certain time interval. A clearly defined goal is the guarantee that the task will be completed perfectly and efficiently. In this, the three foundations of the principle are considered leaders.

The following is an overview of the use of forms of education in the process of teaching natural sciences and the creation of an educational environment.

Theoretical knowledge in education is absorbed into practical, everyday life processes and leads to the formation of practical skills.

At the stage of "heard" - in the form of a theoretical lesson, a lecture, a conversation, is conducted in the form of a hickory and acquires the necessary knowledge.

At the "Saw" stage-practical classes, laboratory and seminar classes are organized and skills and skills are formed.

At the "I have done" stage-in the form of independent education, learners transform knowledge, skills and qualifications acquired in two stages into competencies.

The pedagogical-innovation project is organized in three stages, providing the opportunity to connect and strengthen the theory with practice. In Phase 1, it is predicted that students have acquired 40-50% of the knowledge to be acquired, and in Phase 2, 60-70% of the knowledge acquired by students, while in the final phase, the educational performance is predicted to reach 80-100%. The knowledge coefficient acquired by the students involved in the project is proven on the basis of Statistics [13].

Improving the quality of Education based on the development and implementation of the model for the development of education in natural sciences (biology and geography) on the basis of the innovative cluster of pedagogical education is considered one of the main priorities. The innovative cluster of pedagogical education "Heard – saw – done "principle" at the Faculty of Natural Sciences " began to be applied initially from 2020, as an experiment-test. According to the principle of pedagogical education, experimental test work was carried out at the Faculty of natural sciences, students of the 3rd stage of the direction of biology. The experiment was organized in accordance with the principle of "Heard-saw-done" theoretical, practical classes of students who took part in the synophonic work and independent educational tasks.

The effect of the result of the lecture session conducted with students was controlled through test questions compiled at a productive level. The test questions for control helped to verify the theoretical acquired knowledge of the students.

### **ANALYSIS AND RESULTS**

Once the students' level of knowledge has been determined, subjects from the methodology of teaching biology are assigned to students for Independent Education. When covering these topics, a draft drawing is presented in accordance with the principle of the cluster. At first, the teacher of the methodology of teaching biology to students covers the topic in the form of a lecture, with the help of presentations. This stage corresponds to the "Heard" column of the pedagogical-innovative project, theoretical knowledge is acquired by students on science.

The next stage will consist in presenting the theoretical knowledge given to students at the "Saw" stage, as virtual laboratory sessions. Laboratory training is the three main objectives:

1. Educational purpose-theoretical knowledge acquired by students provides the opportunity to perform in practice as well as substantiate the theoretical knowledge gained in experience.

2. Educational purpose-the fact that the issues covered by students on the topic have the opportunity to be used in the educational experience, and the experience of betrayal is formed in students through vitagenic technologies.

3. Through the developer goal-the " Saw " stage, students will have the opportunity to apply theoretical knowledge on the online educational platform in their personal life as well [9]. Knowledge acquired from the surface of Science, finds its significance in everyday life activities.

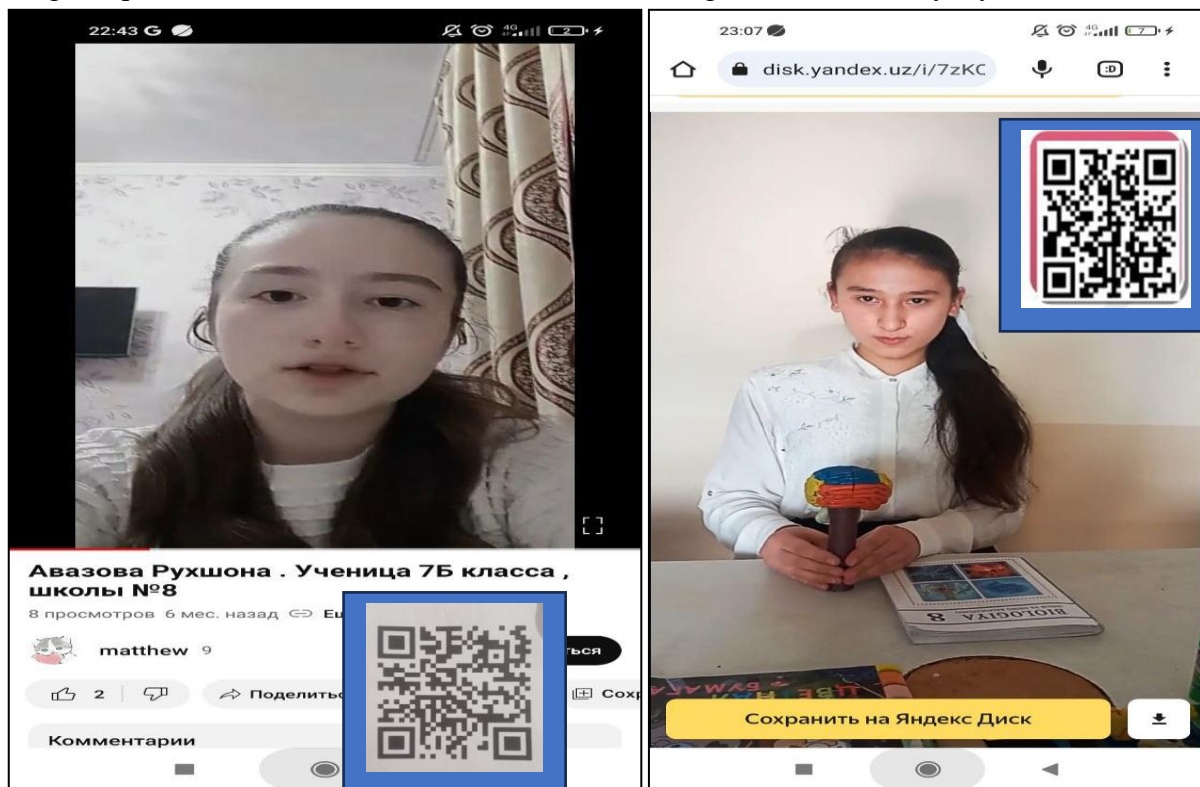


Figure 3. Independent works on the principle of "I heard-I saw-I did " by students.

At this stage, laboratory classes were uploaded to the distance learning platform in the form of videodars as well as a vidio presentation or a short tutorial film. Students study laboratory training by viewing it through a virtual state educational platform[6].

The perfect appropriation of the" saw "phase by students is achieved through test control questions in a" partially traceable " view. Students in the experimental group carry out laboratory-experimental work with the help of a science teacher. Students in the control group, on the other hand, look at the video-lab sessions uploaded to the educational platform and try to acquire the necessary knowledge. The results of the practical experimental stage performed are determined by test control from students. The data obtained is analyzed statistically[10].

The final main stage of the pedagogical-innovative project is called "I have done". At this stage, students will have gone through the main teaching stages. Under the column" I have done", students develop theoretical and practical knowledge through independent work tasks. Independent educational tasks are embedded in the Distance Learning Platform[9]. The peculiarity of this stage is that students, on the basis of the instruction given, independently perform educational tasks. It is at this stage that knowledge "heard", "seen" by students is "fulfilled"by students.

These Phase assignments can be short-term and long-term assignments. The laboratory training carried out in the educational process serves to form both educational and information and communicative competencies of the student.

I have completed rukni will consist of independent educational assignments. At the end of the experiment, students, based on the results of independent work, placed the project electronically (in WORD, PPT format), on an educational platform. The experimental work carried out, on the other hand, is captured and brought to the appearance of a video library (in MR4 format) on the basis of special programs. The work of the vidiolaboratory is brought to a small charge and placed on an educational platform [7].

After the completion of the "Done" column by students, the acquired knowledge of the students is analyzed on the basis of control of non-standard test questions at the final creative level.

## **CONCLUSIONS AND SUGGESTIONS**

The pedagogical-innovation project was organized in three stages, giving the opportunity to connect and strengthen the theory with practice.

In the first stage, it is predicted that students have mastered 40-50% of the knowledge to be mastered, and in the 2nd stage, 60-70% of the knowledge acquired by students, while in the last stage, the educational performance indicator will reach 80-100%. The cognitive coefficient acquired by students participating in the project is proven on the basis of statistical data.

It has been demonstrated that the study of Biological Sciences, improving on the basis of a cluster approach, has several advantages:

The scientific pedagogical methodology of the principle "I heard – I saw - I did" is organized within the science of Microbiology, Zoology and anatomy, achieving practical results through experimental work.

Criteria for evaluating the results of the principle "heard – saw - done" have been given, which has been found that efficiency can also be achieved by applying these criteria in the areas of social and natural-Exact Sciences.

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