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WORK SYSTEM FOR THE FORMATION OF INFORMATION COMPETENCES OF UNIVERSITY STUDENTS

Specialty: 5801.01- Theory and methodology of training and education (methods of teaching computer science)

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GENERAL FEATURES OF RESEARCH

The relevance and degree of work of the subject: Both our independence and the development of society constantly require the application of new methods in the development of education. Observations have shown that in a very short time, great changes have taken place in the world education system, and these changes continue today. Azerbaijani education, as a part of the world education system, changes its content and form according to the demands of time. The state policy for the development of education in Azerbaijan fully allows us to adapt the level of our education to world standards. It is enough to list a number of laws and orders that prove this. However, on this path, our education faces certain problems. Those problems have a negative impact on the interaction of education with life and science. Therefore, innovations are constantly being applied in the field of educational technologies, flexible steps are taken regarding the organization of the educational process, and the content and methods of education are improved. New methods and approaches have already begun to emerge in all fields. Innovative changes lead to the creation of objective contradictions in the school. These contradictions are:

- the contrast between the old and new approaches to specialist training;
- the contradiction between the use of new pedagogical technologies, new programs and the low level of training of the teacher;
- lack of professional training institutes that can provide new education to all those who wish to participate actively in the modernization process of the teacher.

The above-mentioned problems make it possible to formulate the actual scientific problem of the research: what pedagogical conditions should be created to independently develop the teacher's competencies during innovative activity?

Formed contradictions also allow to choose the topic of research: the system of work on formation of informatics competences of higher school students.

The lack of young specialists in higher and secondary educational institutions has a negative impact on the quality of teaching. We know that studying the second content line of informatics takes many years. Therefore, programming issues should be taught from lower grades. This long-term education should be developed by forming in higher schools. A systematic and consistent approach is required for the formation of these competencies . One of the problems is that the education system is busy arming students with theoretical knowledge rather than practical work. True, the role of the subjective factor is not small here, but it is the main issue - lack of necessary supplies. Our education system differs from the education system of many European countries, including Finland, in this respect. The main direction of the Finnish education system is the wide spread of practical training. This principle accompanies Finnish education from the very bottom. Practical work is more interesting and attractive than theoretical work. It connects the student to the learning process without even realizing it, automatically diverts his attention from all extraneous work. Unfortunately, many schools still use authoritarian methods of teaching. Considering the above, it becomes clear that the dissertation is aimed at solving an actual problem.

M.Mahmudov, A.G.Palangov, N.Abishov, M.A.Alyshov and other methodists have extensively touched upon continuous pedagogical education, its structure, function and content in a number of their scientific works. ASAdığözelov, A.M.Qasimova, I.N. Ismayilov, H. Taghiyev, I.B. Ahmadov, G.I. Bashirova and other scientists have also done a lot of work in this field.

Scientists from foreign countries have also made efforts to solve the problem. Among them, Guzanov B.N., Vezirov T.G., Abdurazakov M.M., Abdulgalimov R.M., Pustalova E.I., Mogilyev A.B. there are scientists like S.I. on the formation of student competencies. Arkhangelski, E.Y.Levitski, N.N.Kalatskaya, M.Q.Agayeva, I.N. Aynutdinova, L.Y.Aisner , V.I. Igoshin and other specialists dedicated their research works.

The ideas of the above-mentioned authors and the development of pedagogy ensured the theoretical development of innovative changes in practice. With this, new models of teacher specialization began to be applied.

The object of the research is the teaching process that shows the ways of forming the competencies of students in informatics in higher pedagogical schools.

The subject of the research is the methods and tools selected for the formation of the competences of informatics students in higher pedagogical schools.

The purpose and objectives of the research: to develop and experimentally test the theoretical foundations of the independent development of pedagogical competences of students in the process of innovative activity.

In research work, it is necessary to perform a number of interrelated tasks:

1.To theoretically justify the essence of the independent development of pedagogical competences of students during innovative activity .

2. To experimentally verify the effectiveness of complex pedagogical conditions for the independent development of pedagogical competences of students .

3. To set tasks for students to develop their pedagogical competencies independently in the process of innovative activity.

Research methods: A complex research method was used to successfully complete the research work:

- to study the national and foreign experience on the current problem, to summarize pedagogical research and to conduct a systematic analysis for the effective development of professional education;
- conduct analysis and synthesis on theoretical generalization of research results;
- pedagogical design and modeling;
- surveying, testing and pedagogical diagnostics;
- to observe the process of formation of teacher's pedagogical

competence;

- ❖ conducting practical-experimental work on the implementation of assigned tasks to ensure the effectiveness of the innovative pedagogical process in the higher school;
- ❖ statistical methods for processing results (statistical hypothesis testing, dispersion (branching, splitting) and correlation analyses, use of the EXCEL program).

The following provisions apply to protection:

1. The essence of pedagogical competencies of higher school students is that pedagogical activity is understood as a means of self-realization of pedagogical competencies and the implementation of special pedagogical tasks directed to the goals and content of training. Through this, it is also possible to improve the quality of the teacher's professional activity.

2. In parallel, the methodology of increasing specialization is solved directly during innovative activity.

3. One of the basic indicators for evaluating the level of formation of pedagogical competences of higher school students is the development of their methodological and professional activities during innovative activities.

4. Adaptation of pedagogical competencies of higher school students to the 10-point evaluation system, taking into account innovative activity, determines the level of their pedagogical competencies and creativity.

5. In order to solve the system issues of self-education, a practical approach that integrates psychological, pedagogical and methodological issues, a methodology for organizing a pedagogical experiment that takes into account raising the methodological culture of the teacher is proposed.

The scientific novelty of the research consists of the following:

1. During the innovative activity, the necessary conditions for developing the pedagogical competencies of future teachers were determined:
   - ✓ taking into account the motives of teachers' pedagogical

activity, their needs. It also includes a system of moral and material stimulation.

- ✓ consideration of the actual and potential pedagogical level of the teacher;
- ✓ to involve the teacher in the preparation of assignments and their systematization, because these are the tasks facing the innovative activity of the teacher;
- ✓ to implement the forms and types of pedagogical activity, taking into account the specifics and typology of the solved tasks;
- ✓ to determine the pedagogical type of innovative activity according to each task type;
- ✓ to use a 10-point scale system to evaluate the student's pedagogical competencies.

2. Quality indicators and criteria have been determined to evaluate the level of formation of pedagogical competences in the teacher's innovative activity. In the context of solving tasks during innovative activity, the evaluation criteria of the teacher's pedagogical competencies are as follows:
   - ✓ the ability of the teacher to teach methodologically literately based on traditional programs;
   - ✓ teacher's participation in work on in-depth programs;
   - ✓ participation of the teacher in the development of new author training programs and new technologies;
   - ✓ participation of the teacher in analyzing the results of the pedagogical experiment, diagnostic and quantitative-qualitative results.
3. A 10-point evaluation system was tested to evaluate the student's pedagogical competencies during the innovative activity.

The theoretical importance of the dissertation work:

- ❖ the essence of the work on the formation of pedagogical competencies of higher school students is substantiated;
- ❖ it has been determined that if the content of the pedagogical activity is implemented taking into account the complexity of the pedagogical tasks and their priority area, the quality of the

pedagogical competencies of the higher school students will be significantly increased;

- ❖ it is justified that the application of work on the formation of pedagogical competencies of higher school students is purposeful and productive;
- ❖ during the innovative activity, theoretical provisions were formulated for improving the professional activity of higher school students;

Practical importance:

- ❖ methodology for the formation of pedagogical competencies of higher school students was developed and tested experimentally;
- ❖ a set of didactic conditions for the realization of pedagogical competencies was determined and tested.
- ❖ the stimulation system was used for the development of pedagogical competencies of higher school students;
- ❖ a self-education program has been developed for different groups of students, taking into account their individual abilities.

Research approval was carried out in different ways:

1) In connection with the research work and its results, reports and speeches were made at the following symposiums, international and regional conferences, theses were published: Materials of the 9th International People's Scientific-Practical Conference - held on the theme "Modernization of continuous education" (Republic of Dagestan, Derbent city, 2018); "Pedagogy and psychology in the modern world: theoretical and practical studies" a collection of articles on the materials of the XXVIII international scientific-practical conference, which was also held on the subject . (Moscow, 2019); "European Studies: Innovation in Science, Education and Technology" The topic was also held LVI International Correspondence Scientific and Practical Conference, Collection of scientific articles. (London, United Kingdom, 2019); « International scientific review of the problems of philosophy, psychology and pedagogy» XIV International Correspondence Scientific Conference , a collection of scientific

articles. (Boston, USA, 2019); The VI International Youth Conference (New York, USA, 2019) was held under the theme - "Prospects for science and education" ; " II International Scientific Research Congress" (Ankara, Turkey March 6-8, 2020); Proceedings of the XXX International Multidisciplinary Conference held on the theme "Perspectives and main trends of science in the modern world" (Madrid, Spain, April 24, 2023).

2) The results of the research were reflected in the programs prepared in the department of informatics of GSU, in the texts of lectures and laboratory exercises, as well as in the curriculum of the informatics teaching specialty of the faculty of mathematics and informatics.
3) The problems covered by the research work and various materials showing their solutions have been published in local and foreign journals recommended by the Higher Attestation Commission. In total, 2 textbooks, 8 subject programs, 7 conference materials and 27 the article has been published .

The structure and main content of the work: the dissertation consists of an introduction, five chapters, a conclusion and a bibliographic list. The introductory part of the dissertation consists of 22 pages, chapter I 58, chapter II 42, chapter III 36, chapter IV 50, chapter V 23, results 2 and finally the list of literature is 21 pages. The total volume of the dissertation consists of 257 pages and 413,090 characters including spacing.

THE BASIC CONTENT OF THE RESEARCH

The Introductory part of the dissertation , the relevance of the topic is justified, the scientific novelty of the research is explained, the goals and objectives of the work are defined, the terms to be defended are indicated, and the scientific and practical importance of the research is justified.

The first Chapter is entitled "Fundamentals of the formation of pedagogical competencies of students of universities in computer science." In paragraph I of the chapter called "Basic concepts of research work", the basic concepts of research work were analyzed with the theoretical views of various scientists [4,34]. It is shown that one of the problems facing education is the lack of professional qualifications of the teacher, because it is very important to effectively implement the pedagogical activity. By solving this problem O.S. Bulatov, N.V. Korepanova, Y.K.Chernova and others. they are busy. One of the components of these qualities is the ability to work as a teacher. This ability is closely related to the competence of the teacher. L.D.Stolyarenko tried to consider the components that are closely interacting with each other. He determined that each stage of activity is determined by its specific action. This action serves to form important professional qualities. The specificity of the formed qualities indicates the necessity that is important for the implementation of special training.

Here it is necessary to mention a particularly important issue: when considering the analysis of competencies, the functional approach was taken as the basis, but such an approach requires the separation of a considerable amount of quality that characterizes the pedagogical competence, because the application of the functional approach is traditional. Within this approach, skills included in a certain group of functions are defined. Then those functions are evaluated by methodists. There is no unequivocal opinion here either, because pedagogical functions are explained differently by a number of authors. In practice, the teacher is satisfied with a limited number of tasks. The specialist's competence qualities are determined on the basis of the pedagogical activity of his personal qualities. It would be

good if it would be possible to add the qualities arising from the specificity of pedagogical activity to this list.

Paragraph II, called "Ways of developing pedagogical competences of future teachers during innovative activities", shows the ways of developing pedagogical competencies of teachers during innovative activities. In this regard, O.V. Gukalenko puts forward the following requirements for the teacher's professional training: *"having several languages and knowledge of different cultures, knowing the theory of multicultural education, understanding the socio-psychological characteristics of students, being able to use modern technologies, bringing cultural diversity to the content of general education, pedagogical to organize the process as a dialogue of different cultural carriers according to time and opportunity* [1].

Researcher D.A. Ivanov notes that " *professional competence of a teacher in a general education school combines general and special subject competencies. All special competencies are derived from general ones and are part of it* [2]. Special competencies can be divided into several groups: social-personal competencies (citizenship, self-improvement, social interaction, general culture, etc.); organizational-management competences (the competence to be able to evaluate the results of the activity, the ability to organize the work to achieve the goal, the ability to use innovative ideas, the ability to be ready to take moderate risks and take responsibility for its results); general scientific competencies (cognitive activity competencies, ability to structure and expand knowledge, professional development competencies).

As a result of the innovative activity of teachers and conducting a questionnaire, the following system of pedagogical tasks was developed.

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[1] Gukalenko O.V. Polycultural education: theory and practice. //- Tiraspol : - 2003.

[2] Ivanov D.A. Competence and competence approach in modern education. //- M., - 2007.

1) of a research nature;
2) informatization, computerization;
3) training of students;
4) development of students;
5) education of students;
6) monitoring of training quality;
7) monitoring the quality of education ;
8) informative-methodical provision;
9) communicative;
10) introduction of new educational technologies;
11) activity design .

In paragraph III, called "**Innovative activity as a denator of pedagogical competencies of secondary school teachers**", it is proved that innovative activity is the main driving force of teacher's pedagogical competencies [31]. There is no doubt that any level of pedagogical activity is aimed at ensuring the uniformity and integrity of the process. This shows that pedagogical activity is multifunctional. It refers to the main functions of pedagogical activity: teaching, extracurricular activity, methodical activity, teaching-scientific activity (increasing qualification). The fulfillment of these functions is the formation of competencies that ensure the teacher's professional skills. It is also known that the teacher's professional competencies are the result of a set of general competencies: worldview (from the value-oriented personality), communicative, psychological-pedagogical, legal-normative (related to the readiness to perform professional skills), reflexive, subject and methodical (in the field of professional activity and important in creating motivation for professional development).

In the IV paragraph called "Creation of the environment to implement the pedagogical competencies of the future secondary school teacher during the innovative activity", the issues of creating the environment to implement the pedagogical competencies of the teacher during the innovative activity are explained in detail [8]. The analysis of scientific research works and literature related to the given problem is given in the last V paragraph of Chapter I entitled

"Analysis of scientific research works and literature related to the given problem".

In accordance with the development requirements of modern science of psychology and pedagogy, as well as society, everyone understands well that there is a serious need for new educational structures, especially intensive innovative pedagogical technologies to improve the qualifications of teachers. If this problem is approached carefully, there are many options for raising the professional level of teachers in the field of pedagogy. Those options are a good tool to improve the quality of training to one degree or another.

A.A.Fedorova tried to analyze the problem in her dissertation on "Improving pedagogical classification in context education". Here, special attention is paid to the theoretical preparation of the listeners. Classes are mainly in the form of lectures, seminars, consultations, debates, and in rare cases, practical tasks. Students' independent work is carried out on the basis of individual plans without the need for didactic support and without quality control. All this does not give the necessary practical results, but it does not allow the acquired knowledge to be used to intensify the training process.

The dissertation work of O.V. Varnikova, defended in 2011, entitled "Formation of professional competences in teaching foreign languages of higher school students" is also interesting in this respect. The author of the dissertation notes that " *the subject of activity of a person's social position changes during the transition of a specialist from professional activity to training. This determines many peculiarities in the organization of the training process in the professional development system. The goals, content, contingent of students and the conditions of realization of the training process are among those features. In order to overcome the indicated difficulties, such methods should be used in the training, which can model the*

training activity to the social content. The teacher's professional work and form of communication should change accordingly [3]. "

Self-identification should occur as early as possible, regardless of the type of teacher. The description of the definition of original creativity V. I. It belongs to Andreev. He noted the five stages of self-determination creativity and said, " *It is impossible for teachers to become professional and enter the innovative mode without knowing these stages."*[4] he said . The author defines it as a heuristic instruction in the classification of creative self-determining personalities and teacher's creative self-determination.

I. Scientists such as V. Zolotukhin, L.M. Zakirova, L.B.Vedernikova have conducted some research on the creative self-determination of the educator. The author's conclusion is that *"Education should be evaluated as a whole, because it is the main mechanism of the social circle of quality* [5]. "

At the end of the chapter, the results of the research are listed:

1. Based on the analysis, it was determined that the position of the researchers on the basic concepts related to the topic differ from each other. The author has emphasized only the more characteristic ideas.
2. Azerbaijani schools have sufficiently fertile conditions for the wide spread of innovative technologies. Therefore, legal and normative documents have been prepared and financial resources have been allocated. It is a pity that the funds allocated for the dissemination of innovative technologies were not spent exactly as intended. On the other hand, it has been shown that due to the lack of operativeness in this field, time has been lost and it has been forced to lag behind the rapid development of technologies in the world.

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[3] Varnikova O. B. Formation of professional competence of high school students in the process of foreign language preparation: /dis. .doc. ped. наук: 13.00.08 / - Penza, -2011. - 546 p.

[4] Andreev V.I. Pedagogy. Educational course for creative self-development. /- Kazan: Center of innovative technologies, - 2000, - 606 c .

[5] Vertkin I.M. Struggle and seek... About the qualities of creative personality. //Thread in the labyrinth. — Petrozavodsk: Karelia, 1988.-24 c.

3. As a result of the analysis conducted by the author, it was found that the social status of the teacher does not correspond to the requirements of the time. Despite the fact that the head of state signed a decree on granting special status to teachers and 12 years have passed since then, such a status has not yet been granted to teachers. This, in turn, does not affect the social and household life of the teacher. A teacher who finds it difficult to meet the material and spiritual needs of his family will never find time to engage in creative pedagogical work. Many teachers do not see a special social perspective for their profession. Within this professional sphere, old directions have been lost, and new ones have not been established. Almost a few years ago, we witnessed the tendency of the social status of the teacher to decrease in the society. As a result of measures taken by the Ministry of Education and higher authorities, the financial situation of a number of teachers has improved. The expression "a number" was used because today there are no wide opportunities for inter-sectoral and intra-sectoral competition in the education system of Azerbaijan. Only those teachers who work in private schools or are engaged in independent tutoring activities can sell their knowledge and turn it into money. The fact that the number is small is not the main condition, the main thing is that the army of teachers builds its activities on the basis of financial incentives, and this serves as an example for other teachers. What is important is the beginning of a positive trend. Thus, there are certain factors for the revival of the social and cultural status of the educator in our society [32].

4. Taking into account the ratio of motivation and demotivation in the teacher's work, it can be noted that the pedagogical corps strives for professional independence and spares no effort to improve its status. There are many facts that confirm this. One of those facts is the revival of the private sector and the creation of fertile conditions for teachers working in this sector to approach their work responsibly. The prevailing payment system in the private sector and the interaction between learners and educators, as well as demands, push the teacher to constantly improve his pedagogical skills. The

way to increase pedagogical mastery is to use innovative technologies widely. Only after that, motivation during innovative activity is provided in the form of a system, the teacher can implement his pedagogical competencies at the required level [10].

5. Unfortunately, the level of self-development of pedagogical competencies still lags behind the radical renewal of the education system. Such a situation cannot but have a negative impact on the training and education process.

6. Analyzing the work of various universities that provide teaching profession, it can be concluded that its traditional system has had a positive effect on the development of education. However, many positions of traditional education have already lost their relevance and do not meet the requirements of the modern school. Although the new system has not yet reached the necessary point in its development, innovative forms of self-development and development of professional competencies are already visible.

7. Pedagogical competences can be defined as a synthesis of pedagogical skills and professional abilities that are adequate for certain types of tasks (determining success in the activity of the educator).

8. Although a number of attempts have been made to create a competitive environment in the education system of our country, there is still no question of creating a systematic education market [29].

9. In recent years, in the field of additional education of teachers, a new model based on the module-credit system, creating a competitive environment, taking into account stimulation and career development has been implemented, and active interactive training technologies have been tested. In addition, the methods used by most teachers in the teaching process lag behind modern requirements. In many cases, students are not taught the ability to apply the acquired knowledge and independent creative thinking [27].

The Second Chapter is entitled "Electronic training system and its use in the formation of pedagogical competencies of students". In paragraph I of this chapter entitled "Detailed

information about the electronic education system", it is shown that the stable development of the society provides a stable and innovative education based on the pedagogy of understanding. IM Ilinsky notes that *"new technologies bring innovation to employees not only in the scope of their knowledge, skills and habits, but also in their creativity and personal qualities (initiative, prudence, activity)"* [6]

After the research in this paragraph, the author concludes that digital technology is not the only tool to improve the quality of education. Changes must occur not only in the technological sector, but also in the social and mental sector. E-learning is not a false alchemy, but only a component of a holistic education system. This requires resources, educators' efforts, and time.

Paragraph II of the chapter is entiteld "Segments of the electronic learning system and their relative unity". It has been shown that all segments of the electronic learning environment (ELE) are interrelated. Thus, a change in one of the segments necessarily causes a change in the others. The relationship between them and the environment as a whole are changing [26], an efficient tool is needed to assess the quality of ETM. This tool is necessary to be able to evaluate the effectiveness of using ICT in the realization of all components of ETM. New educational technologies are needed to realize all this. For new educational technologies, it is important to have the following:

1) new educational standard, new basic curriculum, new training-methodical set (TMK);

2) a new mechanism for financing the educational process, updating the mechanism for selecting personnel and attracting personnel who meet modern requirements to the school;

3) formation of a socially oriented concept in the school's development program: health school, full-day school, orientation school, externship, family school;

[6]Ilinsky I.M. Educational revolution. //-Moscow: Изд-во Моск. humanit.-social. akademii, -2002, -p.173-174.

4) a new form of training based on the school's technical equipment (school computerization and Internet access) and new competencies of educators and managers in accordance with the specified changes;

5) expansion and development of distance learning among the school's student and teacher contingent;

6) a developed class-lesson system that offers an alternative learning process based on the new work regulations of the school, a unified informational educational space.

The role of the electronic education system in the formation of student-teacher competencies is justified in paragraph III entitled "The role of the electronic education system in the formation of student-teacher competencies" [24].

In the IV paragraph entiteld "The importance of using the electronic learning system in the formation of the competencies of high school students in the field of informatics", a structural-functional model was created to reveal the relationship of the studied object, which is the main purpose of pedagogical research, established through the performed functions. The main goal of the created model is to bring the information competencies of students studying in pedagogical universities to the ideal level. According to the author, students of the faculty of mathematics and informatics should have these competencies: to be able to use standard tools when processing information, to skillfully use information technologies to organize teaching work on the subject, and to acquire terminological competencies. The author sees the participation of students as subjects of the educational process in each structural element in a graphic representation as follows:

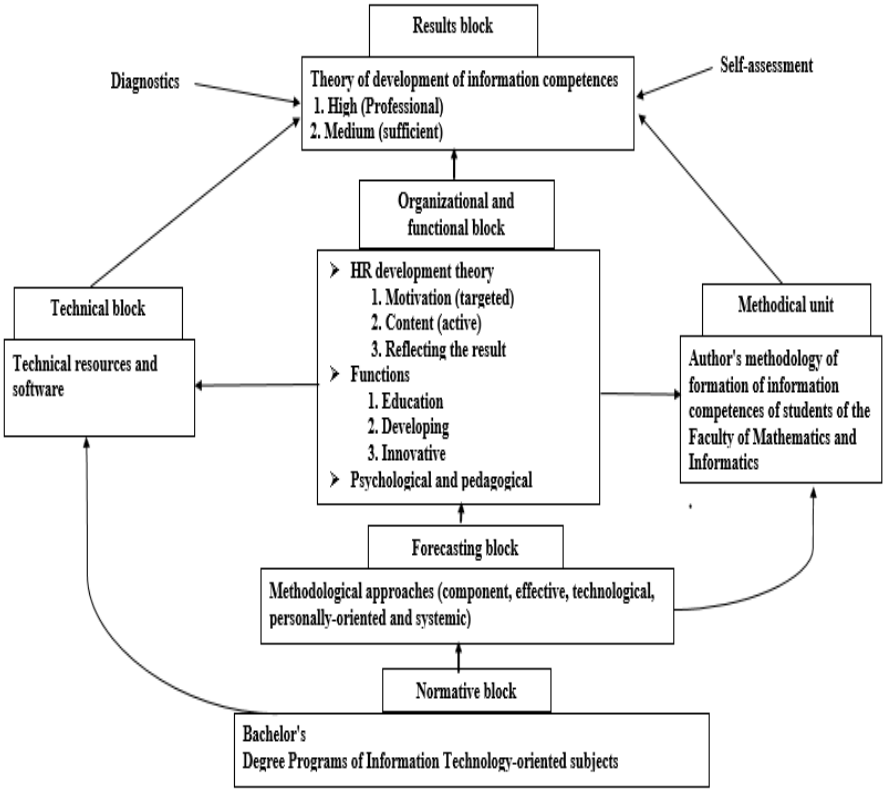

Chart 2.4.3. Structural-functional model on the formation of information competences of students of pedagogical university.

In paragraph V, entiteld "Special laboratory work for the formation of students' information competences and its advantages", it is indicated that the process of teaching students computer technologies in order to obtain information should be closely accompanied by the complementation of theoretical fundamentals and practical direction. This is one of the important principles of modern pedagogy. One of the educational activities used during the formation of students' information competences is their individual

independent work in computer classrooms where laboratory work is performed. The importance of these works for the training process was emphasized by V.I. Silina, E.B. Starichenko, S.E. Tikhomirov and others. researchers emphasized. R. Williams, S. Gershunsky, VS Minkin, S.V. Panyukova note three advantages of computer technologies over traditional training methods in their research. Considering their opinions in the creation of special laboratory works for the formation of students' information competences, the author listed the following advantages:[30]

- real individualization of the training process according to the content, volume and pace of its assimilation;
- creation of positive motivation for training thanks to the comfort psychological conditions of the students, the objective assessment of the completed tasks;
- changing the character of the teacher's work, its partial liberation from primitive work, creative nature of the activity.

In the following table, the author proposed the evaluation criteria for the formation of information competences of students of the pedagogical university:[30]

Table 2.5.1.

The table of grade criteria for the formation of information competences of students of pedagogical university

No	***The name of the criteria***	***Characteristics***	***Honey Lar***
Competencies in the field of using standard means of information processing			
M1	Knowledge of the functional principles of the hardware and software composition of a personal computer	The student has the necessary knowledge to perform training tasks with the help of a personal computer. Knowledge of computer software and hardware is fragmentary, but sufficient to complete training tasks.	2
			1
		The student does not have the necessary knowledge about the hardware and software components of the personal computer, as a result of which he is unable to perform training tasks using a personal computer (PC).	0

Following Table 2.5.1.

No	*The name of the criteria*	*Characteristics*	*Honey Lar*
M2	Carrying out information searches in local and global computer networks (at the same time in the Internet)	Acquired skills allow you to perform training tasks.	2
		The acquired skills are not sufficient to fully perform the proposed training tasks.	1
		The skills are not formed, the solution of the set tasks is not demonstrated.	0
M3	Preparation of text and table documents	The student has acquired sufficient skills to complete the training tasks.	2
		Skills are fragmentary, technical and logical errors are made when performing training tasks.	1
		With the help of text and table editors, the student is unable to complete the training tasks.	0
M4	Carrying out training tasks through FC	Training tasks and problems are performed independently.	2
		Periodically, the teacher's help is needed, but most of the work is done independently.	1
		The student cannot complete the task without the teacher's help.	0
M5	Integrity and correctness of task execution with the help of FC	All tasks proposed by the teacher are performed by the student. The obtained results fully meet the requirements.	2
		Most of the task is done. The obtained results are partially correct.	1
		The student has completed 40 percent of the tasks, but the results are not appropriate.	0

Following Table 2.5.1.

No	*The name of the criteria*	*Characteristics*	*Honey Lar*
With the help of computer technologies in the subject competencies in the field of training work			
M6	Work with application software	The student can work fully with the application software.	2
		Students are shown the ability to work with TPT in practice, but there were enough tasks that were not completed properly.	1
		A student with TPT does not have the ability to work.	0
M7	Creating a website	A student can create a website to complete a specific task in the subject area.	2
		His website creation skills are fragmented. Uses a limited level to complete assigned tasks.	1
		No ability to create a website.	0
M8	Carrying out training tasks through computer technologies using the experience of working with FC	The students are shown the knowledge, habit and way of doing things that they have already acquired.	2
		Students perform such activities that are not enough for learning activity.	1
		Prior knowledge is not self-evident.	0
M9	A creative approach is not used when performing the training task with the help of computer technologies	The student creatively approaches the solution of tasks set by the teacher (proposes his own topic, chooses interesting material).	2
		The creative approach is used by the student only when the question is asked. This requires an unequivocal creative approach.	1
		A creative approach is not required in the performance of training tasks.	0

Following Table 2.5.1.

No	*The name of the criteria*	*Characteristics*	*Honey Lar*
M 10	Completing the training task in the field with the help of FC	The student completes all stages of training tasks through FC.	2
		The student performs the training tasks through computer technologies, partly with the help of the teacher.	1
		The teacher's help is always required to complete the training task.	0
Terminological competencies			
M 11	Uncovering the content of terms	The student fully understands the content of information technology terms.	2
		Definitions of terms are not clearly understood when explained.	1
		The student cannot open the basic content of information technology terms.	0
M 12	The possibility of oral expression of the material	When giving an oral answer, the material is clearly expressed, logical sequence is included in the statement. Mathematical and computer technology is used accurately.	2
		No logical sequence is expected in the verbal response. The use of terms is often arbitrary.	1
		Specific terminology is not used correctly in the oral response. The material is explained illogically.	0
M 13	A written statement of the material.	When performing writing tasks, concepts are independently correctly defined.	2
		Certain mistakes are made in the written definition of concepts.	1
		Information technology terms are incorrectly defined in writing.	0
M 14	Carrying out searches on the definition of terms.	A high level of analytical thinking is demonstrated when defining any term.	2
		Visual observation is felt when defining concepts. Certain mistakes are made.	1
		The search for a definition of any term is not felt.	0

Following Table 2.5.1.

No	*The name of the criteria*	*Characteristics*	*Honey Lar*
M 15	Selection and separation of terms from normative documents.	The student can easily choose information-communication terms from normative documents.	2
		The selection of terms from normative documents is incomplete. Some mistakes are made.	1
		When analyzing documents, the student is unable to select terms.	0

At the end of the chapter, based on his conclusions, the author listed the skills that the students of the pedagogical university should perform in their future professional activities:

- identify and evaluate information sources;
- search for training information in local and global computing networks;
- process and store information using standard means of information processing;
- creating multimedia products with the help of a personal computer;
- information-technology-oriented understanding- managing the categorical apparatus.

The Third Chapter is entitled "Use of applied programs in the formation of information work competencies of future informatics teachers". In paragraph I of this chapter entitled "Analysis of the existing curricula and programs in the field of informatics teaching of higher schools" for the first time, the analysis of the current curricula and subject programs used in the field of informatics teaching of higher schools was carried out . the teaching plans of the teaching specialties were reviewed, and it was revealed that the situation is once again deplorable. It has been shown that the subjects given in the curriculum for all three majors are 90 percent identical. It can be understood that the subjects of all three curricula are the same in block I, but the fact that the subjects of block II (specialized vocational training) are approximately 90 percent is not

at all understandable. Therefore, a comparative analysis was conducted on one of the three curricula, specifically the curricula of Ganja State University, which has a student contingent for teaching Informatics, and the curricula of Azerbaijan State Pedagogical University, and the existing defects and recommendations for their elimination were noted:

1. At first glance, these two curricula are known to be identical or transferred from each other. The difference is only in the number of total hours and corresponding credits. The number of hours and credits in the curriculum of GSU is less than that of ADPU. There is also a difference in the number of subjects, GSU has 39 and ADPU has 40. Also, the number and alternative of subjects presented in the block of elective subjects is still the majority in ADPU.

2. Inconsistency of the number of hours indicated in the curriculum with the real time allocation given to it. - In the first semester, 15 weeks were given to study the theoretical material. During that period, state-level holidays are observed every year. Because of this, it is necessary to spend extra hours so that the program is not in deficit at the end of the semester. Spending an extra hour or two in each subject causes students and teachers to be overburdened at the end of the semester. Still, considering the final assessment of collegiums and freelance work, it is easy to imagine that the difficulty is greater. This has a very negative effect on the quality. In some subjects, the hours of both the lecture and the practical lesson are determined by a single number, which means that the last lesson is incomplete. Imagine that after 40-45 minutes in one compound, the lesson ends, they go to recess, while in other neighboring auditoriums, the lesson is being conducted at that time. This causes disruption of their studies. For example, 45 hours of lecture and laboratory sessions in the subject of Operating System and Computer Architecture are allocated each. One of them should be increased and the other should be decreased. In addition, if we pay attention to the content of the subject, we will see that it is necessary to teach some of the topics as theoretical material as a seminar

exercise, and others as a laboratory exercise. For example, it would be more correct to teach in the form of 30 hours of lectures, 30 hours of seminars and 30 hours of laboratory exercises.

3. Placement of subjects that are not important for the specialty subject in the curriculum. For example, 150 hours have been allocated for the teaching of the subject of the Azerbaijani language and parts of speech, which is an insignificant subject for the specialization, in the humanitarian subject block. Of these total hours, 90 hours are outside the classroom, and 60 hours are classroom (30 lectures, 30 seminars).

It is planned to teach the subject of ordinary differential equations in the 1st semester of the 2nd year. How can a student who has not yet mastered Mathematical analysis learn this subject? This subject does not need to be taught in a Computer Science major, or teaching a few simple high school related materials is appropriate. What has been mentioned can also be applied to the subject of probability theory and mathematical statistics. The most unacceptable fact is that subjects such as Mathematical-physical equations, Theory of functions with real variables, Theory of functions with complex variables, and Functional analysis are also included in the syllabus of this specialty as optional subject blocks. Even some of them start to be taught from the II year, while according to the principle of succession, students will not be able to understand the content of the subject at all. However, instead of these subjects, there is a need to teach new subjects and programs related to Informatics.

4. Improper selection of the time when subjects are taught and not expecting interdisciplinary connection and succession. As an example, the subject of Algorithms theory can be shown. The content of the subject contains a lot of material related to higher mathematics. According to the curriculum, the teaching of the subject is planned for the 1st year, and at this time, students' knowledge of higher mathematics is not sufficient. Conversely, Operating systems and computer architecture are taught in the III year, while they should be taught in the I year. First of all, it is

known that every person who is engaged in computer first of all encounters with operating system and computer architecture. Secondly, this subject does not depend on other subjects, so there is no need to wait for succession here. Also, usually, due to lack of experience, academic debt can arise in many students from the first year. If there is no succession, they can be admitted to other specialty subjects in the next semester. This makes it possible for students to pay off this loan later. In the subjects with inheritance, this creates bigger problems in the next semester, the student faces a situation where he already owes 5-6, and sometimes more, subjects in the fourth year. Such cases create new problems for both students and parents, as well as for the university. Such examples can be shown in the curriculum.

5. Failure to determine the course load per semester in ascending order and according to students' activity, etc. So, while the number of subjects taught in the first semester of the 1st year is equal to 6, it is equal to 5 in the 2nd and 3rd semesters. For this reason, the number of exams in the first semester was 6, and 5 in the 2nd and 3rd semesters. In my opinion. The first semester had to be less, in the following semesters the number of subjects could be one more. Apart from this, other defects can also be shown. For example, there is a lack of system in the subjects of the vocational training department. This was wrongly placed earlier in the times when the content of the subjects was not so clear and there was not enough literature, and it is continued in this order today. Here, in the sixth block, a subject called Applied programs was introduced, and in the seventh block, a database subject was introduced in MS Access. Either it should have been one of these, or the name of one of the more specific applications should have replaced the previous one. It can be concluded from this that it is impossible to train teachers with the competencies required by the existing educational programs and subject programs[39] .

In the next paragraph II of the chapter, applied software tools and their characteristics are shown [3], in paragraph III in the Excel application program [23], and finally in paragraph IV in the Access

database program, the issues of using creative tasks in increasing students' work competencies with information are given with examples.

Chapter IV is called "Using instrumental programs to qualitatively increase the professional competencies of future informatics teachers". Paragraph I of this chapter entitled "Conversion of a mathematical model to a computer model and step-by-step realization of its solution" shows the traditional advantages of mathematical models and the necessity of using modeling. According to the author, this necessity is determined by the following:

- many objects or problems related to them cannot be studied directly
- these problems are generally not solvable
- these studies require a lot of time and resources.

It is necessary to carry out many procedures until the solution is realized. When performing these procedures, the ability to think logically and new competencies are formed in students. To understand the essence of modeling, the following scheme was considered.

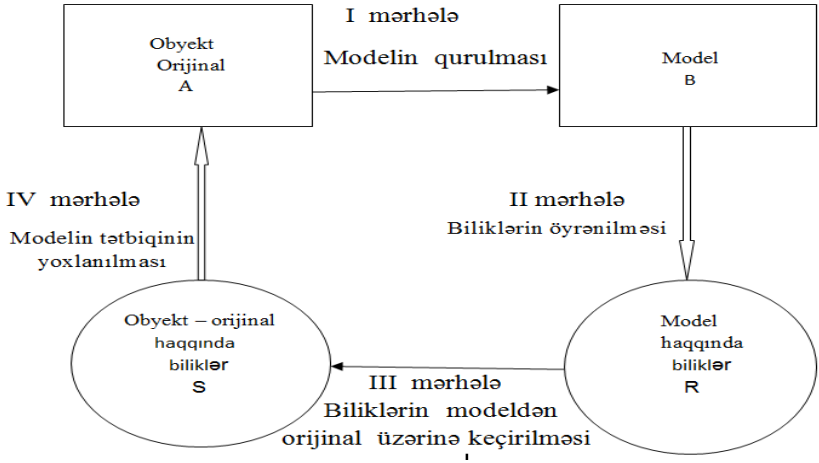

Chart 4.1.1. The main stages of the modeling process.

The above-mentioned was reviewed on practical examples related to computer modeling of education, and the following stages were performed to prepare a computer model of the given issue:

- the first stage is the preparation of the mathematical formulation of the problem;
- both the natural and the graphical model of the second stage natural algorithm are developed;
- thirdly, a model of program compilation is developed in any programming language in an algorithmic language;
- fourthly, it is necessary to prepare its implementation on the computer.

Paragraph II of the chapter is called "Instrumental software tools and their characteristics". It is noted here that since the Python programming language, which is newly taught in secondary schools, is new for students, its teaching causes both theoretical and practical problems. There are many reasons for these problems. The most important reason for the problems is that this knowledge is not systematically studied either in higher pedagogic schools or secondary general education schools. For this reason, as a result, most of the teachers who teach the subject either have very superficial knowledge in this field or do not know the content of the Python programming language at all. Taking into account all these shortcomings, the author proposed a completely different methodology and approach. The basis of this methodology is to teach and experimentally check the theoretical part of the material to be taught by putting it into practice in parallel.

In paragraph II, instrumental software tools and their characteristics [6] are given with examples in the Python language [20], in paragraph III , the methodology of teaching programming in the Java programming language with examples is shown [21]. In the next paragraph entitled "Methodology for developing students' competencies in C++ programming language", the methodology for developing students' competencies in C++ programming language is based on its nature.

Chapter V is entiteld " Pedagogical experiment and

analysis of its results ". The author's proposal to verify the correctness of the hypothesis put forward in this chapter and to improve the competencies of future informatics teachers A pedagogical experiment was conducted to determine the effectiveness of the methodical system and its effectiveness was clearly proven by facts [36] .

The stages of the pedagogical experiment covering the years 2017-2019 are described in paragraph I entitled "Stages of conducting the pedagogical experiment and interpretation of the assigned tasks". In the first stage (2017), which is called the initial stage of empirical and theoretical research, the purpose of the research is to develop new ways and methods for improving students' competencies , the essence of the problem, the study of the situation regarding the problem in the higher school experience, theoretical and methodical solutions to the problem. the basics have been determined. First, the working hypothesis of the research was - formulated and expressed, then favorable conditions for the implementation of the experiment and universities where the experiment will be conducted were determined. Pedagogical experiment in two teacher-training universities of the republic - Ganja State University and Azerbaijan State Pedagogical University Mathematics-informatics It is planned to be conducted in the faculties .

The state of computerization in both universities was studied, the selection of groups for experiments was made based on the observation of training in the second half of the academic year. Informatics lessons were listened to in the groups to be selected for the experiment, students' activity was observed in the teaching process, written and oral tests were conducted with them.

The analysis of the results of the written work conducted with students showed that the vast majority of students want to give priority to the application of new information technologies. A questionnaire survey was conducted with teachers who teach informatics in these groups. According to the survey, it was found that teachers try to use new learning technologies, active learning

methods (heuristic, interactive, etc.) in the teaching process. However, most of the students face great difficulties in mastering the elements of programming, they cannot apply the acquired knowledge to the solution of concrete studies, there are deficiencies in the knowledge and skills of the students. In the course of the conducted pedagogical experiment, the deficiencies in the knowledge and skills of the students, the difficulties they faced in the process of learning the programming elements, and the difficulties they faced were clarified once again, and appropriate corrections were made in the content of the training and in the selection of training methods to eliminate them.

After the initial checks, the experimental and control groups were clearly defined, and the levels of students and teachers in those groups were expected to be approximately equal in terms of the subject of the study.

In the second phase of the pedagogical experiment (2017/2018 academic years), which is called the educational one, programs, textbooks, lesson plans , ICT tools to be used for teaching individual subjects of the mathematics - informatics faculty of the mathematics-informatics faculty with a new method , including teaching-research work was conducted on learning and mastering the methodical system developed for their use. Thus, it consisted of developing the methodology of using ICT tools to increase students' competencies , introducing the content and methodology of the teachers of the experimental groups, and conducting an educational experiment on the new system developed in the experimental groups .

Efforts were made to form the necessary work habits of teachers and students with the help of ICT tools , and preparatory work was carried out in this field. Thus, in order to conduct training in experimental groups with our proposed methodology, an exemplary scenario of lessons on separate topics was prepared and - distributed to subject teachers participating in the experiment. The goals and objectives of the experiment were explained to them. In the course of the experiment, the proposals, recommendations and notes

of the teachers were carefully examined and those that served the ideas of the research were taken into account. The teachers participating in the experiment were provided with appropriate instructions on conducting the experimental training in time.

A significant part of the tasks used in exemplary lesson scenarios, rich in creative tasks and examples of their implementation, prepared for teaching both applied programs and instrumental programs, were selected from mathematics and informatics textbooks and teaching aids. In the scenarios, the program of these tasks is compiled and the ways of their application to solving mathematical problems are shown. For example, examples of the use of mathematical problems in teaching the topic of variable types and input operator in C++ from the subject of Programming languages in the Informatics major were shown.

In the third stage (2018/2019 academic years) of the pedagogical experiment, which is called the checker, after studying and finishing the program material included in the experiment, the check material was determined, and both the experimental and control groups were given a system of studies and check tasks according to the program material. The test writing work includes works that allow to reveal the acquired mathematical knowledge on the subject . Based on the answers to the tests and oral questions, the necessary corrections were made to the presented teaching material.

At this stage, five intermediate inspections were first conducted, and their results were checked and analyzed. At the end of the pedagogical experiment, a final check was conducted based on the improved methodological system, taking into account all corrections and additions, and the result was analyzed.

In paragraph II of the V chapter entitled "Results of the pedagogical experiment and its analysis", the results obtained at each stage of the pedagogical experiment were analyzed by statistical method. The statistical analysis of the results was carried out in the following way: the first results of the inspection are K_i , the result of the I inspection - K_1 , the result of the II inspection - K_2 and so on. pointing to the final result - named K_y . K's indicate the ratio of the

results of the experiment and the results of the control groups for each test. The numerical average value of mastering by the university was also calculated as the numerical average of the average values obtained by groups .

Here,

K_i (in initial inspection)$=\frac{numerical\ average\ value\ of\ the\ experimental\ group}{numerical\ average\ value\ of\ the\ control\ group}$

$K_1(in\ the\ first\ control)=\frac{numerical\ average\ value\ of\ the\ experimental\ \text{group}}{numerical\ average\ value\ of\ the\ control\ \text{group}}$

$K_2(in\ the\ second\ control)=\frac{numerical\ average\ value\ of\ the\ experimental\ \text{group}}{numerical\ average\ value\ of\ the\ control\ \text{group}}$

...

$K_y(in\ the\ final\ control)=\frac{numerical\ average\ value\ of\ the\ experimental\ \text{group}}{numerical\ average\ value\ of\ the\ control\ \text{group}}$

Table 5.2.1
The results of the preliminary inspection

Universitetlər	Qruplar	Tələbələrin sayı	Qiymətlər				A və B %-lə	Yoxlamada mənimsə%-lə	Ədədi orta qiymət
			A	B	C	D			
ADPU	Eksperimental–Rİ-201	25	4	5	8	8	36	68	3,2
	Kontrol-Rİ-202	24	5	6	6	7	46	71	3,38
	Eksperimental –İ-201	21	3	5	8	5	38	76	3,28
	Kontrol-İ-202	20	3	7	6	4	50	80	3,45
	Eksperimental-İ-301	20	4	7	5	4	55	80	3,55
	Kontrol-İ-301	24	5	8	9	2	54	92	3,66
GDU	Eksperimeyntal- Rİ-2¹	33	6	8	8	11	42	67	3,27
	Kontrol- Rİ-2²	22	3	6	8	5	41	77	3,31
	Eksperimental- İM-1¹	39	7	9	15	8	41	79	3,38
	Kontrol- İM-1²	19	4	4	8	3	42	84	3,47
	Eksperimental- İM-2²	28	4	9	7	8	46	71	3,32
	Kontrol- İM-2¹	25	4	8	7	6	48	76	3,4

Table 5.2.2.
Numerical average price of acquisition by universities

Universitetər	Qruplar	Ə.O.Q.İlkin	Ə.O.Q.1	Ə.O.Q."2	Ə.O.Q.3	Ə.O.Q.4	Ə.O.Q.5	Ə.O.Q. Yekun
	Eksperimental –Rİ-201	3,2	3,34	3,56	3,7	3,7	3,78	3,8
ADPU	Kontrol-Rİ-202	3,38	3,5	3,54	3,52	3,4	3,54	3,4
	Eksperimental –İ-201	3,28	3,32	3,38	3,75	3,72	3,78	3,8
	Kontrol- İ-202	3,45	3,3	3,55	3,45	3,45	3,2	3,55
	Eksperimental-İ-301	3,55	3,56	3,56	3,7	3,78	3,7	3,85
	Kontrol-İ-302	3,66	3,45	3,33	3,69	3,46	3,5	3,42
	Eksperimeyntal- Rİ-2¹	3,27	3,24	3,45	3,39	3,81	3,54	3,7
	Kontrol- Rİ-2²	3,31	3,23	3,55	3,36	3,36	3,27	3,3
GDU	Eksperimental- İM-1¹	3,38	3,4	3,53	3,58	3,69	3,68	3,95
	Kontrol- İM-1²	3,47	3,47	3,5	3,26	3,52	3,26	3,47
	Eksperimental- İM-2²	3,3	3,46	3,38	3,55	3,53	3,56	3,83
	Kontrol- İM-2¹	3,41	3,42	3,4	3,38	3,28	3,38	3,39

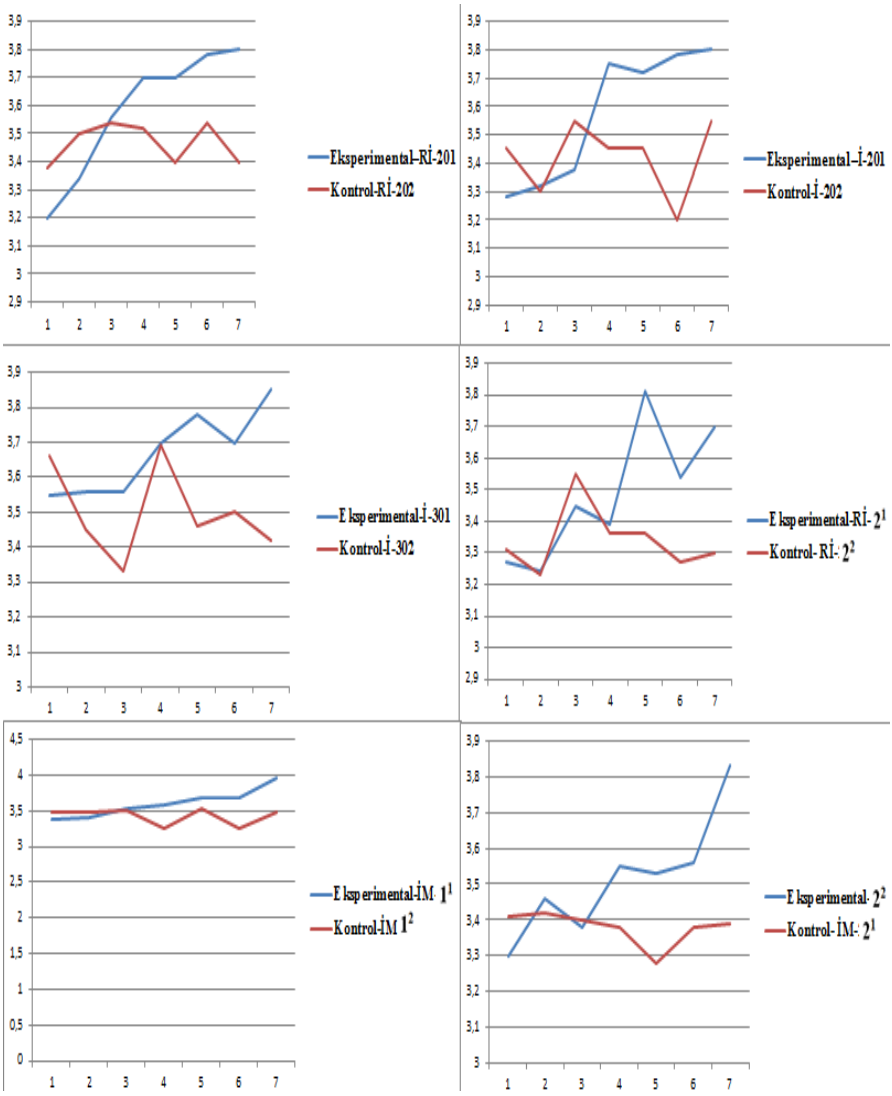

Chart 5.2.1. Appropriation by universities numerical average price chart.

universities was calculated as follows:

k_{io} - the numerical average value of the ratio of the results of the experimental and control groups in the initial examination,

k_{1o} - the numerical average value of the ratio of the results of the experimental and control groups in the first examination , etc.

$k_{yo} = (RI201_{Ky} + I201_{Ky} + I301_{Ky}):3$

Here, k_{yo} - the final numerical average grade for universities ,

$RI201_{Ky}$ - RI201 in the faculty final numerical average grade for the group ,

$I201_{Ky}$ - I201 at the faculty final numerical average grade for the group ,

$I301_{Ky}$ - the final numerical average grade for the I301 group at the faculty ,

From Table 5.2.3, it is known that in conditions where experiments are continuously conducted, RI-201 of Azerbaijan State Pedagogical University, The relative average statistical value of mastery level in 202 groups is from 0.96 to 1.10, RI- 2^1 , IM-1^2 , IM- 2^1 of Ganja State University increases from 0.97 to 1.11 in groups .

Table 5.2.3.
The level of adoption by universities relative average statistical price table.

		k_i	k_1	k_2	k_3	k_4	k_5	k_y
ADPU	RİI201	0,95	0,95	1,01	1,05	1,09	1,07	1,12
	İ-201	0,95	1,01	0,95	1,09	1,08	1,18	1,07
	İ-301	0,97	1,03	1,07	1,00	1,09	1,06	1,13
Ko		0,96	1,00	1,01	1,05	1,09	1,10	1,10
GDU	Rİ-2^1	0,99	1,00	0,97	1,01	1,13	1,08	1,12
	İM-1^2	0,95	1,01	0,95	1,09	1,08	1,18	1,07
	İM-2^1	0,97	1,03	1,07	1,00	1,09	1,06	1,13
k_o		0,97	1,01	1,00	1,03	1,10	1,11	1,11

During the course of the experiment, it was also determined that

a) Solving problems with mathematical content increases the responsibility of students , causes them to approach training more seriously;

b) students' interest in the subject increases, they try to do more programming;

c) students come to each lesson prepared, they know that, as usual, their knowledge will be promptly checked today;

knowledge and skill level of each student information is received in all classes, the general learning dynamics of the group is monitored and necessary assistance is provided;

e) new topics are more easily understood by students compared to the previous period. This is due to the fact that they study the previous topics consistently, because at this time the connection is not broken and the defects in their knowledge are gradually eliminated. Thus, they are more prepared to understand the next topics;

f) by efficient use of time in the learning process, more knowledge is given to students in less time, students' idle time in class decreases and they are always active.

Based on the analysis of the experiment results, we can conclude that the use of creative tasks in the informatics classes of the RI201, 202, I-201,202, I-301,302 groups has been quite effective in increasing the students' competencies . This proves the correctness of the hypothesis put forward in the research work.

In accordance with the goals and objectives of the research, we receive the following **results** :

1. increasing the competencies of future informatics teachers were reviewed, extensive scientific and methodological research was conducted and it was concluded that research works in this field should be continued [34].

2. Future informatics teachers' informatics knowledge to develop creative tasks with mathematical content and organize this teaching there is a serious need.

3. In order to increase the competence of students in the indicated subjects, the content of creative tasks was determined by groups and topics , methods of solving them were developed and recommendations were offered [23]. It was considered that without algorithmization and programming for each task should be used.

4. the existing educational programs and textbooks, it was determined that there are still serious deficiencies in the textbooks and programs in this field [42].

5. Experimental studies and statistical analysis of the results proved the correctness of the hypothesis. Solving problems with theoretical content is strengthened through mathematical problems, accelerates the process of optimization in the content of education, increases the interest of students in subjects [35].

6. Optimizing training with the help of modern computing devices and peripheral devices , application programs is done, the efficiency of the lesson increases [25].

7. The teaching of subjects in universities with modern teaching methods activates , optimizes, and increases the effectiveness of the training, it should be oriented to democratic, humanistic and personality-oriented [24,38].

8. Creative tasks in informatics training accelerate the learning process through ICT and increase interest in it , being the research object of psychologists, pedagogues and methodologists who teach informatics and mathematics subjects due to a number of specific features . This leads to increasing the competencies of both teachers and learners in the training process [22] .

9. In the formation of future teachers in higher schools, parallel strengthening of informatics with mathematical tasks, being multi-disciplinary, brings to the fore the development of necessary knowledge and skills, students' creative thinking, heuristic creative thinking [44]. In order to achieve this goal, it is necessary to choose mathematical problems of an informatic nature and to learn the solutions[41].

10. to develop graphic and spatial concepts of students , to teach the mathematical content line related to the subject of

informatics. This knowledge plays an important role in visualizing the content of the problem , building the model, building and programming the solution algorithm .

The presented concept can be used during the teaching of informatics and mathematics subjects, as well as humanitarian subjects of other teacher-training universities, and this will increase the efficiency of teaching.

The content of the study, the main scientific ideas and results are reflected in the following *works published* by the applicant.

1. Automating the filling of electronic documents using the MS Word program . //-GSU: Collection of scientific works -I, 2015, p.29-33.
2. Hasanova MA Software protection systems in local networks. / M. Hasanova, L. Nagyyeva. //GDU: Collection of scientific works I. 2016, p.12-15
3. Hasanova MA Educational software tools and their types. //- Nakhchivan: News of Nakhchivan Teachers' Institute. -2017. Volume 13, No. 4, p. 83-85.
4. Hasanova MA Information and its mathematical expression.// - Baku: Actual problems of studying humanities, Baku Slavic University. 2018, No. 1, p. 196-200.
5. Hasanova MA Higher school students' possibilities of formation of competences in informatics. .// - Baku: Educational Institute of the Republic of Azerbaijan, Scientific works. 2018, No. 4, p. 195-199.
6. Hasanova MA Requirements for software tools.//-Ganja: GDU. Collection of scientific news, Basic, humanities and natural sciences series. -2018, No. 4, p. 375-379.
7. Hasanova MA Teacher's pedagogical competencies during innovative activity **.** //- Nakhchivan: News of Nakhchivan Teachers' Institute. -2018, volume 14, number 1, p.-29-33.

8. Hasanova MA Teacher's qualifications for that profession in order to realize their professional competences. // - Baku: Actual problems of studying humanities, Baku Slavic University. -2018, No. 2, pp. 187-191
9. Hasanova MA Basics of formation of pedagogical competencies of higher school students in informatics. // - Baku: Educational Institute of the Republic of Azerbaijan, Scientific works. - 2018, No. 5, p. 59-63.
10. Hasanova MA Positive factors realizing Pedagogical competencies of teachers in Azerbaijan education. //- Warszawa: Colloquium-journal. -2018, No. 5(16), -p.31-32.
11. Hasanova MA Characteristics of competence categories. // Materials of the IX International scientific-practical conference on the topic " Modernization of the system of continuous education ", - Derbent, Dagestan, - June 29 - July 1, -2018, p.77-79 .
12. Hasanova MA Architecture and operating systems of computers. Program for Informatics teaching major. /GSU, Scientific Council of the Faculty of Mathematics and Informatics, approved by protocol No. 1 dated 30.09.2019, - GSU publishing house, - 2019, -187 p.
13. Hasanova MA Modern programming languages. Program for Informatics teaching major. /GSU, Scientific Council of the Faculty of Mathematics and Informatics, approved by protocol No. 1 dated 30.09.2019, - GSU publishing house, - 2019, -187 p.
14. Hasanova MA Elective subject - ICT in science and education. Program for all majors at Master's level. /GSU, Scientific Council of the Faculty of Mathematics and Informatics, approved by protocol No. 1 dated 30.09.2019, - GSU publishing house, - 2019, -187 p.
15. Hasanova MA Modern problems of informatics. Program for a computer science major at the master's level. /GSU, Scientific Council of the Faculty of Mathematics and Informatics, approved by protocol No. 1 dated 30.09.2019, - GSU publishing house, - 2019, -187 p.

16. Hasanova MA Theoretical foundations of informatics. Program for a computer science major at the master's level. / A. Aslanov, M. Hasanova. GSU, Scientific Council of the Faculty of Mathematics and Informatics, approved by protocol No. 1 dated 30.09.2019, - GSU publishing house, - 2019, -187 p.
17. Hasanova MA Internet programming. Program for a computer science major at the master's level. / A. Aslanov, M. Hasanova. - GSU, Scientific Council of the Faculty of Mathematics and Informatics, approved by protocol No. 1 dated 30.09.2019, - GSU publishing house, p. - 2019, -187
18. Hasanova MA Modern network technologies. Program for a computer science major at the master's level. / A. Aslanov, M. Hasanova. - GSU, Scientific Council of the Faculty of Mathematics and Informatics, approved by protocol No. 1 dated 30.09.2019, - GSU publishing house, p. - 2019, -187
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