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**THE ROLE OF QUASI-PROFESSIONAL ACTIVITIES IN PREPARATION OF FUTURE TEACHERS OF COMPUTER SCIENCE**

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The article describes the actual problem of professional-pedagogical preparation of the teacher of computer science, analyzes found in the research process contradictions between demands of society for increase of quality of education in higher education establishments which prepare teachers of computer skills and insufficient level of readiness of future specialists for work at school, also between the need for enhancement the system of professional training of future teachers and the lack of theoretical and practical basis concerning the formation of proficiency of future teachers in the process of pedagogical practice. It is determined that quasi-professional activity leads to formation of skills to apply knowledge of fundamental preparation in the sphere of computer science and successfully put it into professional activity.

It has been considered the formalization of the model of organization and realization of work experience internship whereas nowadays there is a need of technologisation of this process by the leaders of pedagogical practice on the basis of secondary schools. This survey gives an opportunity to analyze the condition of pedagogical practice of future teachers of computer skills from viewpoint of trainees.

**Keywords:** pedagogical practice, the training of teachers of computer skills, quasi-professional activities.

Problem statement in a general sense and its relation to important scientific and practical tasks. On rush of technology is the cause of severization of requirements of organization of teaching and learning process in school. The teacher should organize the teaching process in such a way that students have a chance to use modern technical facilities and information technologies in their learning and afterwards professional activity, form skills that are necessary for successful life in information society.

Learning of computer science is aimed to achieve such purposes as acquirement methods for work at computer, ability to use digital technical appliances for work with information, development of manual dexterity, spatial awareness, logical and algorithmic thinking, wakening interest to information and communicative activities.

Nowadays secondary school is general developing which lays a foundation of balanced growth, primary professional training, and capacity for continuing education and learning any specialty of every child. The goal of studying informatics is to realize three of its composition: learning, developing and educative.

Learning goal of studying informatics at school is to give each pupil elementary fundamental knowledge of computer skills including presentation of the process of transformation, data transfer and information using and hereon show up pupils meaning of information process in the shaping modern scientific picture of the world, as well as a role of information technologies and computing technique for development of modern society.

Developing goal of teaching computer science is aimed to enlighten pupils’ basic skills which are necessary for conscious acquisition of knowledge and also other subjects that are studied at school. These knowledge and skills in the domain of computer science appeal to influence on the
formation such personality features as mental stature of pupils, developing their thinking and creative abilities.

Educative goal of computer science at first involves formation of pupil’s world view. The child has an opportunity to acknowledge trends of world development and the role information and communication technologies in this process specifically in the lessons of informatics. Contribution of school course of informatics to the pupils’ scientific view of the world is defined by formation of understanding of information as one of three main concepts of science: matter, energy and information which underlie the construction of the modern scientific picture of the world. There is formed algorithmic thinking and such important human features as ability to plan their work, to do it rationally and critically compare initial plan of the work with real procedure of its execution in the process of learning informatics. Psychological and pedagogical qualities of the teacher essentially influence on the achieving goals in the area of informatics [3].

The problem of professional preparation of the teacher is paid attention at the national level. This is proved by Laws of Ukraine “About Education”, “Higher Education”, State national programme “Education” (Ukraine of the XXI century), national doctrine of development of education in Ukraine, Conception of specialized teaching.

Professional and pedagogical practice of the students dominates in the process of personality formation of the teacher.

The issue of improvement of methodology for teaching of computer science in secondary schools and appropriate competence of informatics teachers is displayed in the works of A.P. Yershova, V.M. Monakhova, A.O. Kuznetsova, N.V. Morze, Iu.S. Ramskooho, T.V. Tykhonovoi etc.

Many scientists research pedagogical education and highlight principles of professional training. The works of F. Honobolina, O. Shcherbakova, Ie. Hryshyna, N. Kuzminoi, V. Slastenina, L. Spirina have fundamental value. O. Abdulina, A. Aleksiuk, V. Andrushchenko, H. Balda, V. Bondar, O. Hluzman, I. Ziaziun, V. Kremen, V. Kuzia, V. Luhovyi, O. Moroz, N. Nyckalo, O. Piekhota, O. Savchenko consider peculiarities of reforming and modernization of the system of higher education, the problem of individualization, person-centered approach and humanization of education. L. Vovk, M. Yevtukha, R. Semernikova, M. Yarmachenko, A. Bieliaieva, A. Verkholia, V. Hubar, H. Zakharevych, M. Kozii, H. Tereshchenko, O. Savchenko, D. Tkhorzhevskyi, Iu. Chyryva take up the problem of training of the pedagogical staff. There are defined content and direction of the person-centered education of the students, formation of creative, socially active personality of the future teacher in the works of I. Bekha, A. Boika, O. Kyrychuka, H. Pustovit, S. Sysoievoi, O. Sukhomlynskoi, T. Sushchenko. N. Dem’ianenko, V. Maiboroda, R. Kulish investigated the history of establishment of pedagogical practice as the part of the all-pedagogical training.

The term «professional training» is designated as gain qualification in relevant specialty in the Law of Ukraine «Higher Education» [2]. However in «Pedagogical encyclopedic dictionary» the term «professional training» is considered as the system of professional training and the main aim of it is rapid assimilation which is necessary for work [4, p. 162].

V. Slastonin defines professional pedagogical training as social-political and scientific knowledge on the subject which is taught, high level of general culture, knowledge of pedagogical theory, general and pedagogical phycology, ability to solve a pedagogical problem and assaysoul-searching, skills of appropriate kinds of educational activity [8].

E. Zeier understands professional training as formation of the system of professional knowledge, skills as well as professionally and socially important features of the personality, experience in solving typical professional problems [1].

O. Pavlyk specifies professional training as the component of psychological-pedagogical system with specific meaning, existence of structure elements, forms of relations, specific traits of academic activity, peculiar knowledge and skills [5].

H. Shuldyk and V. Shuldyk describe professional training as a link between theoretical education and future job. They mention that during pedagogical training not only theoretical and
practical preparation of the student’s ownership of the work is examined but also it’s offered an opportunity to provide a future specialist with creative potential [9].

Quasi-professional activity should be considered as teaching method shaping professional activity during which the students go beyond the handling with the narrow topic of the lesson but solve professional tasks through simulation of real situations.

Quasi-professional activity provides for conditions and dynamic of a real lesson of informatics in the classroom. A. Kuzmyskyi, N. Tarasenko and I. Akulenko comprehend quasi-professional activity as activity in the context of which professional competence is realized in the situations of modulated future actions of the teacher. The most important place is taken by stimulation of the part of the lesson, or work on the specific task in the lesson.

The purpose of the article is to determine the role of quasi-professional activity in preparation of the future informatics teacher.

The modern system of teacher training of computer science is being at the stage of establishment while there are reforms in the system of higher education of Ukraine, which is aimed at developing the personality traits. These reference points are manifested in different ways: in the reorganization of continuous education, the emergence of alternative forms of education, in the development of new approaches at shaping educational content, wide use of new educational interactive technologies. Under these conditions the issues of methodological training of informatics teachers are arisen especially sharp.

Development of means of information, information and especially telecommunication technologies leads to the creation of a new discipline that requires a radical rethinking of the objectives, content, means, methods and forms of training in computer science at the current level and it should be reflected both in the system of basic education and in the training of teaching staff.

Variegated conditions of the studying, a variety of approaches and content of teaching computer science at schools either secondary or higher education have a significant impact on teaching computer science.

There are identified new approaches to forming the system of preparation of informatics teachers:

- with consideration for complex trends in modern education: standardization, technologizing, humanization, continuity, information, etc.;
- conversion of methodical preparation of future teachers from the conceptual level into the operational level with ideas of professionally pedagogical orientation of preparation of future teachers and professionally-oriented teaching and learning of students;
- introduction of different types of basic educational institutions, curriculums and textbooks on computer science for them. This requires coordination of methodical preparation of future teachers with variable system of school education in computer science that is constantly developing.

The above-mentioned principles should be followed upon condition that it is used quasi-professional activities while preparing future teachers of computer science.

Quasi-professional activity can be realized both using role games in the lessons and traineeship at secondary schools.

Profound changes in the conception of teaching computer science and variation the curriculum prevent the completion of the tasks of the teaching process.

Unfortunately, nowadays there is lack of the qualified teachers of computer science. Modern organization of the informatics lessons has a lot of drawbacks caused by low proficiency level of the teachers but more often absolutely deficiency of such a preparation. It is related to the fact that computer science curriculum changes rapidly and unlike previous years pupils start to study this subject from the second grade.

So Ministry of Education and Science approved informatics syllabuses for pupils’ 5-6 grades of secondary schools that learned informatics in the 2-4 grades. It’s also pointed out that the main tasks of studying informatics at school are shaping skills and knowledge which give them a
chance to create information models and work out on them in program environments, to look for information with the help of search systems, to use ICT means for organizing collaboration, to work with information systems etc.

The course «Informatics» is designed to 245 hours and should be taught in an invariable part of curriculum. The total number of hours in the 5-7 grades is 35 hours; in the 8-9 grades is 70 hours. The curriculum is designated gradual complication of the learning material and tentative allocation of two content levels.

There must be a continuation of studying basic ideas of the course begun in the primary school at the first stage (5-7 grades). The second stage (8-9 grades) involves shaping of subject and kea ICT- competences.

The authors of the curriculum confirm that selected and created competency based tasks; a teacher should take into consideration that data processing in the 5-7 grades must be done with the help of one technology or in one program environment, however in the 8-9 grades with the help of a few technologies or several environments. It also should be included a manipulative component in the competency based tasks for any grades.

Therefore the teachers of informatics have to teach using different programs that makes their professional activities more difficult in the conditions of rapid technology changes and varied computer resources in secondary schools. Furthermore it should be emphasized that qualification «informatics teacher» is just a specialization in many secondary schools.

The most actual questions are concerned computer science as a school subject, methodological systems of studying computer science at secondary schools, the content of studying computer science which goes behind the development of the Informatics subject.

Due to the fact, factual level of competence of pupils and teachers is not always suitable to requirements today, the development of resource base of teaching computer science, unequal distribution of computers at schools, realization of intersubject communications, the integrating role of the subject Informatics, outspread of information technologies in teaching all subjects not directly concerning the computer science, development of computer oriented methodological systems of teaching all subjects, particularly subjects of natural-mathematical cycle.

So, it should be noted that the qualification "Teacher of Informatics" is the only specialization in most universities.

We have studied an issue of the preparation of the teachers of computer science in some higher educational institutions of Ukraine, particularly analyzed whether there is the specialty "the teacher of computer science" or the qualification of the teacher of computer science is conferred the students of pedagogical specialties. Results are displayed in Table 1.

Training of the specialist should provide a body of knowledge and skills that are necessary for sufficient use of a computer in the educational process and control of education. The following items refer to this group of knowledge and skills:

- knowledge of the content and teaching methods of Informatics school course;
- knowledge and ability to use basic software systems in teaching (systems of processing files, database, information retrieval systems, client-server architecture, spreadsheets, word processing and graphics tools preparing presentations, statistical processing of numerical data, etc.)
- knowledge and skills necessary for creation of a school library of educational software and maintain this library in working order;
- ability to evaluate educational software and learning outcomes with their use.

From the perspective of the study quasi-professional activities. As follows practical training must provide:

- the students orientation in learning abilities of pupils of different age groups and particularly the middle classes that future teachers understand how the teaching methodology should vary depending on the characteristics of the learning process, learning orientation, age of children, so they can apply this knowledge in practice;
- formation of knowledge and skills that are necessary for understanding approaches towards specialized and layered differentiation of studying, that makes new demands on studying of computer science: preparation of pupils specializing in the humanities should be different from students specializing in natural sciences. The appearance of the specializations related to mathematics and computer science, brings up the question of enhanced studying of computer science at school;
- Formation of the skills to organize various kinds of extracurricular activities of the future teachers. Computer science arouses great interest in students, moreover there are such pupils in the school who want to get deeper knowledge not limited by the school educational process.

Table № 1.

<table>
<thead>
<tr>
<th>Higher educational establishment</th>
<th>Specialty “Teacher of computer science”</th>
<th>Specialization “Teacher of computer science” pedagogical specialty</th>
</tr>
</thead>
<tbody>
<tr>
<td>South Ukraine National Pedagogical University after K.D. Ushynskyi</td>
<td>+</td>
<td>Handicraft lessons and technologies, Physics, Mathematics</td>
</tr>
<tr>
<td>National Pedagogical University after M.P. Drahomanov</td>
<td>+</td>
<td>Primary education, technological education</td>
</tr>
<tr>
<td>Kyiv University after Borys Hrinchenko</td>
<td>+</td>
<td>Mathematics, Primary education</td>
</tr>
<tr>
<td>Khmelnytskyi National University</td>
<td>–</td>
<td>Handicraft lessons and technologies</td>
</tr>
<tr>
<td>Kherson National Technical University</td>
<td>–</td>
<td>Physics, Mathematics, Primary education</td>
</tr>
<tr>
<td>Úmanskyi State Pedagogical University after Pavlo Tychyna</td>
<td>+</td>
<td>Physics, Mathematics</td>
</tr>
<tr>
<td>Kryvorizkyi Pedagogical Institute SHEI “Kryvorizkyi National University”</td>
<td>+</td>
<td>Primary education, technological education, Chemistry, Physics, Mathematics</td>
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</table>

That’s why it is necessary to focus on an issue of effective methods to improve students’ practical training.

During practical training there are occurred contradictions between real and necessary knowledge which is a motive for self-education.

Pedagogical training directly influences on consciousness, cognitive-seeking interest, creative talent of the future teacher and form personal –professional impact on future generations.

Success of pedagogical training depends on many factors:
- choice of the place of training;
- realization of advanced methods and techniques to work in the concrete conditions;
- methodical level and proficiency of the teachers (they promote in their students creative activity, sense of responsibility, determination and conscientious attitude to job).
The work of the practice teacher can be divided into active and passive. During active training the students are often engaged in academic process, they have to give classes, consultations, carry out teaching and guiding work. Continuous communication with children gives an opportunity to acquire pedagogical skills. Complex solution of the problems improves professional competence and form a personality of the future teacher.

During passive practice students attend classes which are given by qualified teachers, get acquainted with organization of education process, peculiarities of methodical work. The practice teachers are given tasks and recommendations according to preparation to classes.

Pedagogical practice informatics curriculum in the system of step by step preparation of the teachers must provide constant improvement, professional advancement, creative enrichment, and desire to make a child happy and to form his competence.

During professional activity a student has to do several tasks. At first to form skills to give a lesson using all modern methods and techniques of teaching activity, in other words to write a plan of the lesson, define objective, tasks and stages of the lesson; choose effective methods that objectives to be achieved; use different levels tasks. At second to develop skills to carry out discipline work in the informatics lessons; form intellectual, emotional spheres of the pupil and his cognitive interest.

Content of work of the practice teacher involves such stages:
- a) insight into specific of the school;
- b) curriculum planning, teaching the lessons of computer science and extracurricular events;
- c) methodical analyses and prediction possible difficulties with lesson material;
- d) attendance and analyses lessons and extracurricular events;
- e) participation in resulting events from teaching practice.

Essential components of a teacher practice activity are analyses and evaluation of effectiveness of his work in the lesson by comparing results of the lesson with its objectives. Both the teacher from school who observed the lesson and also teaching methodology expert could help a student to do this.

Nowadays, for a teacher who has received training philosophical, psychological, generally didactic, logical, mathematical training and knowledge in the area of fundamental problems of computer science, is needed to show creative methods towards teaching computer science students of different ages and in different specializations of educational institutions of humanities, natural sciences, physics and mathematics and other profiles.

During quasi-professional activity students first of all adapt to work of the informatics teacher, realize and estimate their professional choice, having necessary skills for pedagogical activity. This is the beginning of pedagogical excellence. Apparently that students will get application professional-pedagogical knowledge that makes for successful acquirement theoretical courses, they learn to plan their work, share commitments, find suitable material, and evaluate progress and results of work, pupils’ attitude, compare his work with other students.

Eventually collective analyses of students’ events, advice of the leaders of pedagogical practice and teachers of the school lead to self-searching. Then the students and the leaders of pedagogical practice begin to understand that many things have not been considered so the necessity arises for self-searching, self-observation, self-understanding and self-concept immediately during pedagogical practice in order to reach the level of real readiness to work at school. In this period the students desperately need help of the teachers; for each student it is necessary to define suitable methods to give personal support which needs to plan his self-education and self-improvement.
It is possible to make a conclusion thought through the instructions and program of pedagogical practice that during practice the student has to give a certain quantity of lessons; there has been introduced a list of the main events which must be joined in by trainees etc [7, 6]. All the above mentioned on the one hand leads to the students ’work formalization: reproduction of learning and teaching orders and instructions without encouragement creativeness and self-observation; on the other hand the teaching methodology experts attend students lessons just to control, evaluate results of the practice taking into account fulfilling program requirements.

Specifically activity formalization neglects of informative psychological factor of pedagogical practice, its functional potential in the process of personal improvement of the future teacher; activation of life position; development of such character features as sociability, tact, censoriousness etc. So, quasi-professional activity should be considered as social-psychological domain of student professional examination.

As pointed out, the qualification of informatics teachers is conferred on mathematics, physics, primary classes, thecnology teachers.

This survey done by us among teachers of Kherson region allows for defining that only 57% hold a degree in mathematics or physics with specialization in Informatics but 43% involves representatives of other professions in particular programmer engineer, handicraft lessons teacher, primary school teacher, geography and biology teacher, economist etc [10]. It is given no more than 25% of studying time of students for getting specialization. Meanwhile, students have to give control lessons on the specialty (informatics) during training practice.

In Kherson State University the students on the specialty «Physics» or «Mathematics» have to give five lessons with the main specialty and just one lesson on informatics specialization during pedagogical training. Due to the fact that after graduation young specialist is given the qualification of his main specialty and qualification of informatics teacher the question arises about inequality of division of control lessons during practice as well as insufficiently qualified preparation of the specialist.

We have done a survey among students who after graduation from university are obtained the qualification of informatics teacher.

So, 91% respondents turned out the students of 4-5 courses who have already done practical training in secondary schools.

![Fig. 1. The termination of respondents according to study year.](image)

Having said so only 47.8% from them have been done pedagogical practice on informatics.
Among respondents who have been doing practice about 82% has been visited by university professor during their teaching practice in order to control practice activities and give his recommendations and remarks.

Students state, that during teacher practice they had to complete different kinds of pedagogical activities: prepared for lessons, extracurricular events from informatics, do the tasks with programming (Delphi, HTML), as well as give lessons on the course (Microsoft Office). Anyway, teaching practice gives the students an opportunity to discover all sides of pedagogical activities and greatly widen their vision of organization of teaching process, basic principles, get acquainted with different technics and methods of teaching.

When asked if they would like to carry on their teaching activities in educational institutional where they did pedagogical practice, the voices are divided equally. To our minds, the reason for this is attitudes of trainees towards to teacher’s activities, peculiarities of their character as well as qualifications of the teachers who work in these educational institutions. If a trainee sees a negative example he won’t have any desire to develop and improve ways of teaching informatics. If the teacher shows respect to his future colleague, helps him in the organization of quasi-
professional activity, so probability of that a student would like to stay in this educational institution will increase. Therefore, the policy of educational institution especially the subjects teachers who are instructors for trainees has a great importance of personality development of the future informatics teacher.

When asked «What would you like to change during teaching practice?» The students express such feedbacks:

- improve the theoretical knowledge of organization and giving lessons;
- increase the quantity of informatics lessons;
- organize close collaboration between the leader of the practice and trainees in order to analyze the works of the students;
- enlarge the term of teaching practice;
- expand possibilities to use multimedia information technologies while studying informatics;
- to choose such in educational institutions which have enough technics for giving informatics lessons.

Conditions of successful teaching practice and existing gaps are given in Tab.2.

**Table 2.**

<table>
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<tr>
<th>Conditions of successful teaching practice</th>
<th>Existing problems</th>
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<tr>
<td>Close collaboration between the leaders of the practice from educational institutions and higher institutions.</td>
<td>The work of the teacher with the students is not paid that’s why they are not interested in explanation to trainees specialties of teaching activities or try to put a pat of routine on students’ shoulders.</td>
</tr>
<tr>
<td>Selection of the best schools in terms of informatics.</td>
<td>Nowadays the schools are chosen according to the main specialty not taking into consideration the condition of the computer classroom, competence of an informatics teachers that greatly influences on the quality of teaching practice.</td>
</tr>
<tr>
<td>Increase the quantity of hours, which are given for informatics lessons.</td>
<td>Graduates of higher institutions whom are given the qualification “Informatics teachers” while having teaching practice give insufficient quantity of lessons compared with the main specialty, so we believe it necessary to equal this quantity.</td>
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</tbody>
</table>

In such a way, we could define what it is necessary to change for successful realization of quasi professional activity of the future informatics teachers.

**Conclusions.** Organization of preparation of a future specialist in higher institution needs deep investigation because this practice is a link between knowledge acquisition in the process of theoretical training and practical application of knowledge during professional activities.

Taking the above mentioned into consideration it is possible to draw a conclusion that system of psychological and pedagogical preparation in higher institutions is not enough directed to formation of professional features of future teachers and cannot provide high level of their professional competence.

Motivational-value attitude to the profession, the dynamics of interest to the profession after studying different courses of psychological-pedagogical cycle and methods of teaching computer science as well as practical training affects efficiency of formation of professionally-relevant skills.
Evaluating the effectiveness of the formation of professional and pedagogical skills of students during teaching practice showed that the content and organisation of practice not fully provides the formation and significantly important professional skills acquirement.

Besides knowledge of teaching methodology of informatics, the student-trainee has to adjust to such factors as preparation of pupils, their age peculiarities, technical support of the school which we see as informatio-educational environment of secondary school.

During practice there is great pastoral work which is aimed at formation of professional qualities, active life position, civil and moral traits of the future teacher. The student and the students’ community act as object and subject of education. Education of students is closely connected with work with children.

Thus, a teacher having an appropriate level of fundamental preparation in the sphere of computer science, holding knowledge about different approaches to studying informatics at school during quasi-professional activity, gets skills to bring them effectively into professional activity.

However, sooner rather than later there will be young specialists in each school who will be able to transfer knowledge in the sphere of information technologies; there will be more computers in schools and not just in informatics lessons. Even now it is possible to organize teaching process in such a way that pupils can realize the role of information technologies both in studying and everyday life.

**Research prospects.** Development of propositions to higher institutions which are prepared teachers about organization and holding of pedagogical practice, changes in the content component of professional preparation.

**REFERENCES**


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РОЛЬ КВАЗИПРОФЕСІЙНОЇ ДІЯЛЬНОСТІ У ПІДГОТОВЦІ МАЙБУТНЬОГО ВЧИТЕЛЯ ІНФОРМАТИКИ

У статті проаналізовано виявлени у процесі дослідження суперечності між вимогами суспільства щодо підвищення якості освіти у вищих навчальних закладах, які готують учителів інформатики, і недостатнім рівнем готовності майбутніх спеціалістів до роботи у школі, між потребою вдосконалення системи професійної підготовки майбутніх учителів та відсутністю теоретичного та практичного підґрунтя щодо формування досвіду професійної діяльності майбутніх учителів у процесі педагогічної практики. Розглянуто формалізацію моделі організації та проведення виробничої практики, тоді як на сьогоднішній день виникає потреба технологізації цього процесу керівниками педагогічної практики на базі загальноосвітніх навчальних закладів. Проведене опитування дало змогу проаналізувати стан педагогічної практики майбутніх учителів інформатики з точки зору студента-практиканта.

Ключові слова: педагогічна практика, підготовка учителя інформатики, квазіпрофесійна діяльність.